

JEFFERSON MATH PROJECT

REGENTS BY DATE

The NY Geometry Regents Exams
Fall, 2008-January, 2012
(Answer Key)

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Dear Sir

I have to acknowledge the receipt of your favor of May 14. in which you mention that you have finished the 6. first books of Euclid, plane trigonometry, surveying & algebra and ask whether I think a further pursuit of that branch of science would be useful to you. there are some propositions in the latter books of Euclid, & some of Archimedes, which are useful, & I have no doubt you have been made acquainted with them. trigonometry, so far as this, is most valuable to every man, there is scarcely a day in which he will not resort to it for some of the purposes of common life. the science of calculation also is indispensable as far as the extraction of the square & cube roots; Algebra as far as the quadratic equation & the use of logarithms are often of value in ordinary cases: but all beyond these is but a luxury; a delicious luxury indeed; but not to be indulged in by one who is to have a profession to follow for his subsistence. in this light I view the conic sections, curves of the higher orders, perhaps even spherical trigonometry, Algebraical operations beyond the 2d dimension, and fluxions.

Letter from Thomas Jefferson to William G. Munford, Monticello, June 18, 1799.

fall08ge
Answer Section

1 ANS: 3

The diagonals of an isosceles trapezoid are congruent. $5x + 3 = 11x - 5$.

$$6x = 18$$

$$x = 3$$

PTS: 2 REF: fall0801ge STA: G.G.40 TOP: Trapezoids

2 ANS: 4 PTS: 2 REF: fall0802ge STA: G.G.24
TOP: Negations

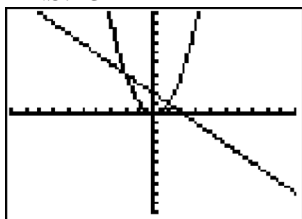
3 ANS: 1

$$(x,y) \rightarrow (x+3,y+1)$$

PTS: 2 REF: fall0803ge STA: G.G.54 TOP: Translations

4 ANS: 3 PTS: 2 REF: fall0804ge STA: G.G.18
TOP: Constructions

5 ANS: 3



PTS: 2 REF: fall0805ge STA: G.G.70 TOP: Quadratic-Linear Systems

6 ANS: 2 PTS: 2 REF: fall0806ge STA: G.G.9
TOP: Planes7 ANS: 1 PTS: 2 REF: fall0807ge STA: G.G.19
TOP: Constructions

8 ANS: 3

The lateral edges of a prism are parallel.

PTS: 2 REF: fall0808ge STA: G.G.10 TOP: Solids

9 ANS: 1

Since $\overline{AC} \cong \overline{BC}$, $m\angle A = m\angle B$ under the Isosceles Triangle Theorem.

PTS: 2 REF: fall0809ge STA: G.G.69 TOP: Triangles in the Coordinate Plane

10 ANS: 4
Median \overline{BF} bisects \overline{AC} so that $\overline{CF} \cong \overline{FA}$.

PTS: 2 REF: fall0810ge STA: G.G.24 TOP: Statements

11 ANS: 3

Because \overline{OC} is a radius, its length is 5. Since $CE = 2OE = 3$. $\triangle EDO$ is a 3-4-5 triangle. If $ED = 4$, $BD = 8$.

PTS: 2 REF: fall0811ge STA: G.G.49 TOP: Chords

12 ANS: 2

The slope of a line in standard form is $-\frac{A}{B}$, so the slope of this line is $\frac{-2}{-1} = 2$. A parallel line would also have a slope of 2. Since the answers are in slope intercept form, find the y-intercept: $y = mx + b$

$$-11 = 2(-3) + b$$

$$-5 = b$$

PTS: 2 REF: fall0812ge STA: G.G.65 TOP: Parallel and Perpendicular Lines

13 ANS: 2

$$M_x = \frac{2+(-4)}{2} = -1. \quad M_y = \frac{-3+6}{2} = \frac{3}{2}.$$

PTS: 2 REF: fall0813ge STA: G.G.66 TOP: Midpoint

14 ANS: 3 PTS: 2 REF: fall0814ge STA: G.G.73

TOP: Equations of Circles

15 ANS: 1

$$3x^2 + 18x + 24$$

$$3(x^2 + 6x + 8)$$

$$3(x+4)(x+2)$$

PTS: 2 REF: fall0815ge STA: G.G.12 TOP: Volume

16 ANS: 3 PTS: 2 REF: fall0816ge STA: G.G.1

TOP: Planes

17 ANS: 2

$$x^2 = 3(x+18)$$

$$x^2 - 3x - 54 = 0$$

$$(x-9)(x+6) = 0$$

$$x = 9$$

PTS: 2 REF: fall0817ge STA: G.G.53 TOP: Segments Intercepted by Circle

KEY: tangent and secant

18 ANS: 4 PTS: 2 REF: fall0818ge STA: G.G.61

TOP: Analytical Representations of Transformations

19 ANS: 2

$$7+18 > 6+12$$

PTS: 2 REF: fall0819ge STA: G.G.33 TOP: Triangle Inequality Theorem

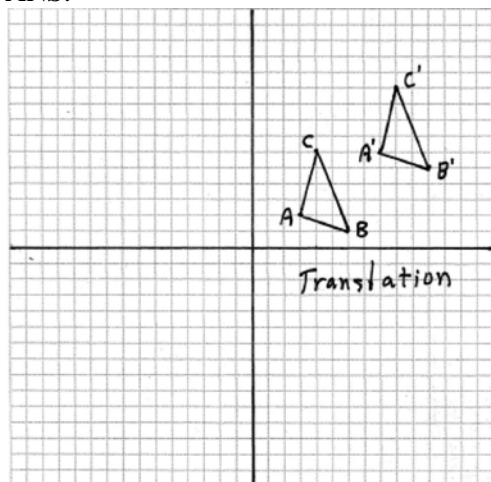
20 ANS: 1

$M_x = \frac{-2+6}{2} = 2$. $M_y = \frac{3+3}{2} = 3$. The center is (2,3). $d = \sqrt{(-2-6)^2 + (3-3)^2} = \sqrt{64+0} = 8$. If the diameter is 8, the radius is 4 and $r^2 = 16$.

PTS: 2 REF: fall0820ge STA: G.G.71 TOP: Equations of Circles

- 21 ANS: 1
 $\triangle PRT$ and $\triangle SRQ$ share $\angle R$ and it is given that $\angle RPT \cong \angle RSQ$.
- PTS: 2 REF: fall0821ge STA: G.G.44 TOP: Similarity Proofs
- 22 ANS: 4
 $3y + 1 = 6x + 4$ $2y + 1 = x - 9$
 $3y = 6x + 3$ $2y = x - 10$
 $y = 2x + 1$ $y = \frac{1}{2}x - 5$
- PTS: 2 REF: fall0822ge STA: G.G.63 TOP: Parallel and Perpendicular Lines
- 23 ANS: 1
 After the translation, the coordinates are $A'(-1,5)$ and $B'(3,4)$. After the dilation, the coordinates are $A''(-2,10)$ and $B''(6,8)$.
- PTS: 2 REF: fall0823ge STA: G.G.58 TOP: Compositions of Transformations
- 24 ANS: 4 PTS: 2 REF: fall0824ge STA: G.G.50
 TOP: Tangents KEY: common tangency
- 25 ANS: 3 PTS: 2 REF: fall0825ge STA: G.G.21
 TOP: Centroid, Orthocenter, Incenter and Circumcenter
- 26 ANS: 4
 Corresponding angles of similar triangles are congruent.
- PTS: 2 REF: fall0826ge STA: G.G.45 TOP: Similarity
 KEY: perimeter and area
- 27 ANS: 4
 $(n - 2)180 = (8 - 2)180 = 1080$. $\frac{1080}{8} = 135$.
- PTS: 2 REF: fall0827ge STA: G.G.37 TOP: Interior and Exterior Angles of Polygons
- 28 ANS: 2
 The slope of a line in standard form is $-\frac{A}{B}$ so the slope of this line is $-\frac{5}{3}$ Perpendicular lines have slope that are the opposite and reciprocal of each other.
- PTS: 2 REF: fall0828ge STA: G.G.62 TOP: Parallel and Perpendicular Lines
- 29 ANS:
 $2\sqrt{3}$. $x^2 = 3 \cdot 4$
 $x = \sqrt{12} = 2\sqrt{3}$
- PTS: 2 REF: fall0829ge STA: G.G.47 TOP: Similarity
 KEY: altitude

30 ANS:



PTS: 2

REF: fall0830ge

STA: G.G.55

TOP: Properties of Transformations

31 ANS:

$$25. d = \sqrt{(-3-4)^2 + (1-25)^2} = \sqrt{49+576} = \sqrt{625} = 25.$$

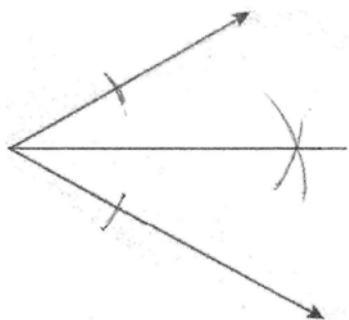
PTS: 2

REF: fall0831ge

STA: G.G.67

TOP: Distance

32 ANS:



PTS: 2

REF: fall0832ge

STA: G.G.17

TOP: Constructions

33 ANS:

$$22.4. \quad V = \pi r^2 h$$

$$12566.4 = \pi r^2 \cdot 8$$

$$r^2 = \frac{12566.4}{8\pi}$$

$$r \approx 22.4$$

PTS: 2

REF: fall0833ge

STA: G.G.14

TOP: Volume

34 ANS:

Contrapositive-If two angles of a triangle are not congruent, the sides opposite those angles are not congruent.

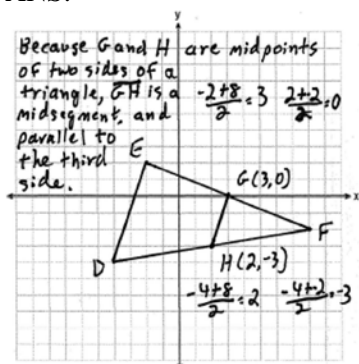
PTS: 2

REF: fall0834ge

STA: G.G.26

TOP: Conditional Statements

35 ANS:



PTS: 4 REF: fall0835ge STA: G.G.42 TOP: Midsegments

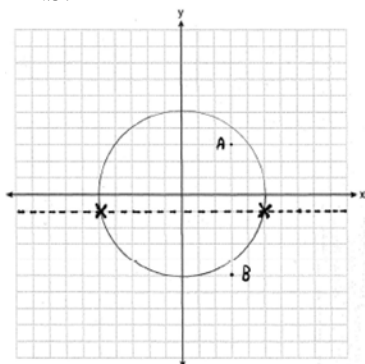
36 ANS:

$\angle D$, $\angle G$ and 24° or $\angle E$, $\angle F$ and 84° . $m\widehat{FE} = \frac{2}{15} \times 360 = 48$. Since the chords forming $\angle D$ and $\angle G$ are intercepted by \widehat{FE} , their measure is 24° . $m\widehat{GD} = \frac{7}{15} \times 360 = 168$. Since the chords forming $\angle E$ and $\angle F$ are intercepted by \widehat{GD} , their measure is 84° .

PTS: 4 REF: fall0836ge STA: G.G.51 TOP: Arcs Determined by Angles

KEY: inscribed

37 ANS:



PTS: 4 REF: fall0837ge STA: G.G.23 TOP: Locus

38 ANS:

Because $\overline{AB} \parallel \overline{DC}$, $\widehat{AD} \cong \widehat{BC}$ since parallel chords intersect congruent arcs. $\angle BDC \cong \angle ACD$ because inscribed angles that intercept congruent arcs are congruent. $\overline{AD} \cong \overline{BC}$ since congruent chords intersect congruent arcs. $\overline{DC} \cong \overline{CD}$ because of the reflexive property. Therefore, $\triangle ACD \cong \triangle BDC$ because of SAS.

PTS: 6 REF: fall0838ge STA: G.G.27 TOP: Circle Proofs

0609ge
Answer Section

1 ANS: 1

If $\angle A$ is at minimum (50°) and $\angle B$ is at minimum (90°), $\angle C$ is at maximum of 40° ($180^\circ - (50^\circ + 90^\circ)$). If $\angle A$ is at maximum (60°) and $\angle B$ is at maximum (100°), $\angle C$ is at minimum of 20° ($180^\circ - (60^\circ + 100^\circ)$).

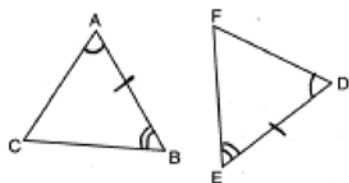
PTS: 2

REF: 060901ge

STA: G.G.30

TOP: Interior and Exterior Angles of Triangles

2 ANS: 3



PTS: 2

REF: 060902ge

STA: G.G.28

TOP: Triangle Congruency

3 ANS: 1

PTS: 2

REF: 060903ge

STA: G.G.56

TOP: Identifying Transformations

4 ANS: 4

PTS: 2

REF: 060904ge

STA: G.G.13

TOP: Solids

5 ANS: 3

PTS: 2

REF: 060905ge

STA: G.G.54

TOP: Reflections KEY: basic

6 ANS: 2

Parallel chords intercept congruent arcs. $m\widehat{AD} = m\widehat{BC} = 60$. $m\angle CDB = \frac{1}{2} m\widehat{BC} = 30$.

PTS: 2

REF: 060906ge

STA: G.G.52

TOP: Chords

7 ANS: 2

The slope of $y = \frac{1}{2}x + 5$ is $\frac{1}{2}$. The slope of a perpendicular line is -2 . $y = mx + b$

$$5 = (-2)(-2) + b$$

$$b = 1$$

PTS: 2

REF: 060907ge

STA: G.G.64

TOP: Parallel and Perpendicular Lines

8 ANS: 3

PTS: 2

REF: 060908ge

STA: G.G.60

TOP: Identifying Transformations

9 ANS: 1

In an equilateral triangle, each interior angle is 60° and each exterior angle is 120° ($180^\circ - 60^\circ$). The sum of the three interior angles is 180° and the sum of the three exterior angles is 360° .

PTS: 2

REF: 060909ge

STA: G.G.30

TOP: Interior and Exterior Angles of Triangles

10 ANS: 2

PTS: 2

REF: 060910ge

STA: G.G.71

TOP: Equations of Circles

11 ANS: 2

Longest side of a triangle is opposite the largest angle. Shortest side is opposite the smallest angle.

PTS: 2

REF: 060911ge

STA: G.G.34

TOP: Angle Side Relationship

12 ANS: 4 PTS: 2 REF: 060912ge STA: G.G.23
TOP: Locus

13 ANS: 4 PTS: 2 REF: 060913ge STA: G.G.26
TOP: Conditional Statements

14 ANS: 2
The centroid divides each median into segments whose lengths are in the ratio 2 : 1.

PTS: 2 REF: 060914ge STA: G.G.43 TOP: Centroid

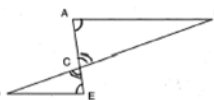
15 ANS: 1
 $\overline{AB} = 10$ since $\triangle ABC$ is a 6-8-10 triangle. $6^2 = 10x$
 $3.6 = x$

PTS: 2 REF: 060915ge STA: G.G.47 TOP: Similarity
KEY: leg

16 ANS: 3
 $4(x+4) = 8^2$
 $4x + 16 = 64$
 $x = 12$

PTS: 2 REF: 060916ge STA: G.G.53 TOP: Segments Intercepted by Circle
KEY: tangent and secant

17 ANS: 2



$\angle ACB$ and $\angle ECD$ are congruent vertical angles and $\angle CAB \cong \angle CED$.

PTS: 2 REF: 060917ge STA: G.G.44 TOP: Similarity Proofs

18 ANS: 1 PTS: 2 REF: 060918ge STA: G.G.2
TOP: Planes

19 ANS: 4
 $M_x = \frac{-6+1}{2} = -\frac{5}{2}$. $M_y = \frac{1+8}{2} = \frac{9}{2}$.

PTS: 2 REF: 060919ge STA: G.G.66 TOP: Midpoint

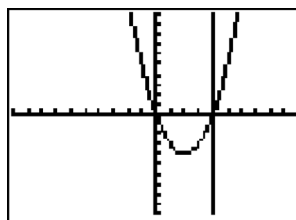
20 ANS: 1 PTS: 2 REF: 060920ge STA: G.G.74
TOP: Graphing Circles

21 ANS: 1
 $V = \frac{1}{3} \pi r^2 h = \frac{1}{3} \pi \cdot 4^2 \cdot 12 \approx 201$

PTS: 2 REF: 060921ge STA: G.G.15 TOP: Volume and Lateral Area

22 ANS: 4 PTS: 2 REF: 060922ge STA: G.G.73
TOP: Equations of Circles

23 ANS: 1



$y = x^2 - 4x = (4)^2 - 4(4) = 0$. (4,0) is the only intersection.

PTS: 2 REF: 060923ge STA: G.G.70 TOP: Quadratic-Linear Systems

24 ANS: 4

(4) is not true if $\angle PQR$ is obtuse.

PTS: 2 REF: 060924ge STA: G.G.32 TOP: Exterior Angle Theorem

25 ANS: 3

PTS: 2

REF: 060925ge

STA: G.G.17

TOP: Constructions

26 ANS: 2

The slope of $2x + 3y = 12$ is $-\frac{A}{B} = -\frac{2}{3}$. The slope of a perpendicular line is $\frac{3}{2}$. Rewritten in slope intercept form,

(2) becomes $y = \frac{3}{2}x + 3$.

PTS: 2 REF: 060926ge STA: G.G.63 TOP: Parallel and Perpendicular Lines

27 ANS: 4

$\triangle ABC \sim \triangle DBE$. $\frac{\overline{AB}}{\overline{DB}} = \frac{\overline{AC}}{\overline{DE}}$

$\frac{9}{2} = \frac{x}{3}$

$x = 13.5$

PTS: 2 REF: 060927ge STA: G.G.46 TOP: Side Splitter Theorem

28 ANS: 3

PTS: 2

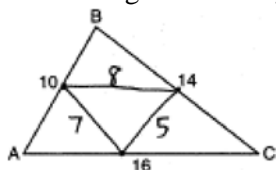
REF: 060928ge

STA: G.G.8

TOP: Planes

29 ANS:

20. The sides of the triangle formed by connecting the midpoints are half the sides of the original triangle.



$5 + 7 + 8 = 20$.

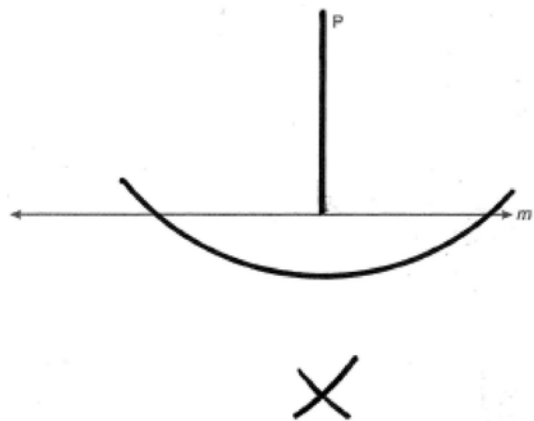
PTS: 2

REF: 060929ge

STA: G.G.42

TOP: Midsegments

30 ANS:



PTS: 2

REF: 060930ge

STA: G.G.19

TOP: Constructions

31 ANS:

$$y = -2x + 14. \text{ The slope of } 2x + y = 3 \text{ is } \frac{-A}{B} = \frac{-2}{1} = -2. \text{ } y = mx + b \text{ .}$$

$$4 = (-2)(5) + b$$

$$b = 14$$

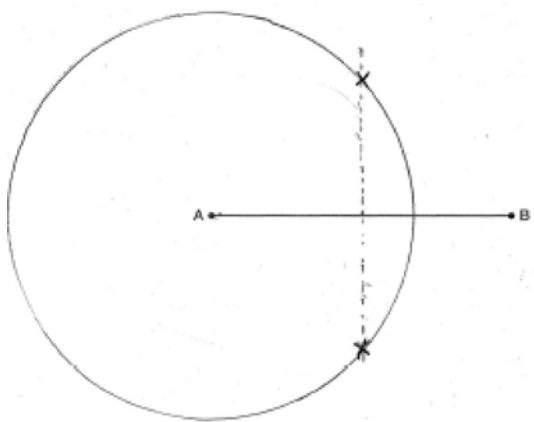
PTS: 2

REF: 060931ge

STA: G.G.65

TOP: Parallel and Perpendicular Lines

32 ANS:



PTS: 2

REF: 060932ge

STA: G.G.22

TOP: Locus

33 ANS:

True. The first statement is true and the second statement is false. In a disjunction, if either statement is true, the disjunction is true.

PTS: 2

REF: 060933ge

STA: G.G.25

TOP: Compound Statements

KEY: disjunction

34 ANS:

$$20. 5x + 10 = 4x + 30$$

$$x = 20$$

PTS: 2

REF: 060934ge

STA: G.G.45

TOP: Similarity

KEY: basic

35 ANS:

18. If the ratio of TA to AC is 1:3, the ratio of TE to ES is also 1:3. $x + 3x = 24$. $3(6) = 18$.

$$x = 6$$

PTS: 4

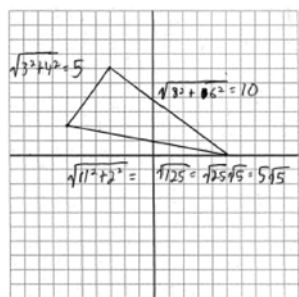
REF: 060935ge

STA: G.G.50

TOP: Tangents

KEY: common tangency

36 ANS:



$$15 + 5\sqrt{5}$$

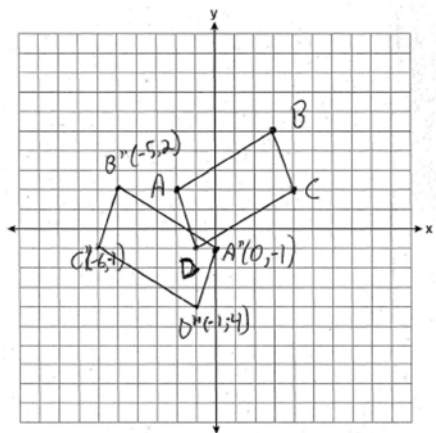
PTS: 4

REF: 060936ge

STA: G.G.69

TOP: Triangles in the Coordinate Plane

37 ANS:



PTS: 4

REF: 060937ge

STA: G.G.54

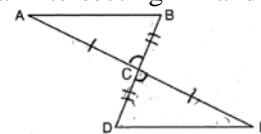
TOP: Compositions of Transformations

KEY: grids

38 ANS:

$\overline{AC} \cong \overline{EC}$ and $\overline{DC} \cong \overline{BC}$ because of the definition of midpoint. $\angle ACB \cong \angle ECD$ because of vertical angles. $\triangle ABC \cong \triangle EDC$ because of SAS. $\angle CDE \cong \angle CBA$ because of CPCTC. \overline{BD} is a transversal intersecting \overline{AB} and

\overline{ED} . Therefore $\overline{AB} \parallel \overline{DE}$ because $\angle CDE$ and $\angle CBA$ are congruent alternate interior angles.



PTS: 6

REF: 060938ge

STA: G.G.27

TOP: Triangle Proofs

0809ge
Answer Section

1 ANS: 4

The marked 60° angle and the angle above it are on the same straight line and supplementary. This unmarked supplementary angle is 120° . Because the unmarked 120° angle and the marked 120° angle are alternate exterior angles and congruent, $d \parallel e$.

PTS: 2 REF: 080901ge STA: G.G.35 TOP: Parallel Lines and Transversals

2 ANS: 3 PTS: 2 REF: 080902ge STA: G.G.17

TOP: Constructions

3 ANS: 4

$$180 - (40 + 40) = 100$$

PTS: 2 REF: 080903ge STA: G.G.31 TOP: Isosceles Triangle Theorem

4 ANS: 2

Parallel chords intercept congruent arcs. $\widehat{mAC} = \widehat{mBD} = 30$. $180 - 30 - 30 = 120$.

PTS: 2 REF: 080904ge STA: G.G.52 TOP: Chords

5 ANS: 4 PTS: 2 REF: 080905ge STA: G.G.29

TOP: Triangle Congruency

6 ANS: 2

A dilation affects distance, not angle measure.

PTS: 2 REF: 080906ge STA: G.G.60 TOP: Identifying Transformations

7 ANS: 1

$\angle DCB$ and $\angle ADC$ are supplementary adjacent angles of a parallelogram. $180 - 120 = 60$. $\angle 2 = 60 - 45 = 15$.

PTS: 2 REF: 080907ge STA: G.G.38 TOP: Parallelograms

8 ANS: 1

Translations and reflections do not affect distance.

PTS: 2 REF: 080908ge STA: G.G.59 TOP: Properties of Transformations

9 ANS: 3

The slope of $y = x + 2$ is 1. The slope of $y - x = -1$ is $\frac{-A}{B} = \frac{-(-1)}{1} = 1$.

PTS: 2 REF: 080909ge STA: G.G.63 TOP: Parallel and Perpendicular Lines

10 ANS: 2

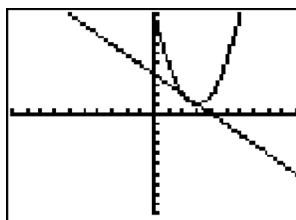
$$M_x = \frac{-2+6}{2} = 2. \quad M_y = \frac{-4+2}{2} = -1$$

PTS: 2 REF: 080910ge STA: G.G.66 TOP: Midpoint

11 ANS: 1 PTS: 2 REF: 080911ge STA: G.G.73

TOP: Equations of Circles

12 ANS: 4



$$y + x = 4 \quad x^2 - 6x + 10 = -x + 4 \quad y + x = 4 \quad y + 2 = 4$$

$$y = -x + 4 \quad x^2 - 5x + 6 = 0 \quad y + 3 = 4 \quad y = 2$$

$$(x - 3)(x - 2) = 0 \quad y = 1$$

$$x = 3 \text{ or } 2$$

PTS: 2 REF: 080912ge STA: G.G.70 TOP: Quadratic-Linear Systems

13 ANS: 3 PTS: 2 REF: 080913ge STA: G.G.28
TOP: Triangle Congruency

14 ANS: 4 PTS: 2 REF: 080914ge STA: G.G.7
TOP: Planes

15 ANS: 4 PTS: 2 REF: 080915ge STA: G.G.56
TOP: Identifying Transformations

16 ANS: 2
 $6 + 17 > 22$

PTS: 2 REF: 080916ge STA: G.G.33 TOP: Triangle Inequality Theorem

17 ANS: 4

The slope of $y = -\frac{2}{3}x - 5$ is $-\frac{2}{3}$. Perpendicular lines have slope that are opposite reciprocals.

PTS: 2 REF: 080917ge STA: G.G.62 TOP: Parallel and Perpendicular Lines

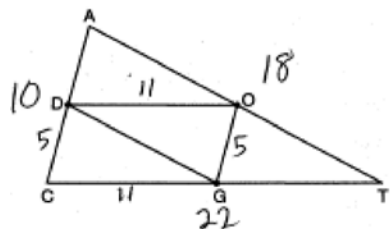
18 ANS: 1 PTS: 2 REF: 080918ge STA: G.G.41
TOP: Special Quadrilaterals

19 ANS: 1

$$d = \sqrt{(-4 - 2)^2 + (5 - (-5))^2} = \sqrt{36 + 100} = \sqrt{136} = \sqrt{4 \cdot 34} = 2\sqrt{34}.$$

PTS: 2 REF: 080919ge STA: G.G.67 TOP: Distance

20 ANS: 3



PTS: 2 REF: 080920ge STA: G.G.42 TOP: Midsegments

21 ANS: 2 PTS: 2 REF: 080921ge STA: G.G.72
TOP: Equations of Circles

22 ANS: 4

$$\text{Let } \overline{AD} = x. \quad 36x = 12^2$$

$$x = 4$$

PTS: 2

REF: 080922ge

STA: G.G.47

TOP: Similarity

KEY: leg

23 ANS: 2

$$4(4x - 3) = 3(2x + 8)$$

$$16x - 12 = 6x + 24$$

$$10x = 36$$

$$x = 3.6$$

PTS: 2

REF: 080923ge

STA: G.G.53

TOP: Segments Intercepted by Circle

KEY: two chords

24 ANS: 3

PTS: 2

REF: 080924ge

STA: G.G.24

TOP: Negations

25 ANS: 4

PTS: 2

REF: 080925ge

STA: G.G.21

TOP: Centroid, Orthocenter, Incenter and Circumcenter

26 ANS: 1

$$V = \pi r^2 h$$

$$1000 = \pi r^2 \cdot 8$$

$$r^2 = \frac{1000}{8\pi}$$

$$r \approx 6.3$$

PTS: 2

REF: 080926ge

STA: G.G.14

TOP: Volume

27 ANS: 2

PTS: 2

REF: 080927ge

STA: G.G.4

TOP: Planes

28 ANS: 3

PTS: 2

REF: 080928ge

STA: G.G.50

TOP: Tangents

KEY: common tangency

29 ANS:

3. The non-parallel sides of an isosceles trapezoid are congruent. $2x + 5 = 3x + 2$

$$x = 3$$

PTS: 2

REF: 080929ge

STA: G.G.40

TOP: Trapezoids

30 ANS:

$$2016. \quad V = \frac{1}{3} Bh = \frac{1}{3} s^2 h = \frac{1}{3} 12^2 \cdot 42 = 2016$$

PTS: 2

REF: 080930ge

STA: G.G.13

TOP: Volume

31 ANS:

$$y = \frac{2}{3}x - 9. \text{ The slope of } 2x - 3y = 11 \text{ is } -\frac{A}{B} = \frac{-2}{-3} = \frac{2}{3}. -5 = \left(\frac{2}{3}\right)(6) + b$$

$$-5 = 4 + b$$

$$b = -9$$

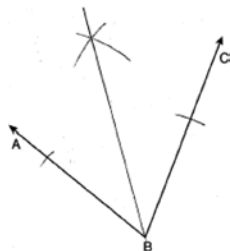
PTS: 2

REF: 080931ge

STA: G.G.65

TOP: Parallel and Perpendicular Lines

32 ANS:



PTS: 2

REF: 080932ge

STA: G.G.17

TOP: Constructions

33 ANS:

$$26. x + 3x + 5x - 54 = 180$$

$$9x = 234$$

$$x = 26$$

PTS: 2

REF: 080933ge

STA: G.G.30

TOP: Interior and Exterior Angles of Triangles

34 ANS:

\overline{AC} . $m\angle BCA = 63$ and $m\angle ABC = 80$. \overline{AC} is the longest side as it is opposite the largest angle.

PTS: 2

REF: 080934ge

STA: G.G.34

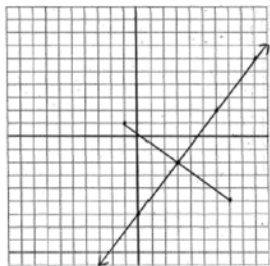
TOP: Angle Side Relationship

35 ANS:

$y = \frac{4}{3}x - 6$. $M_x = \frac{-1+7}{2} = 3$ The perpendicular bisector goes through $(3, -2)$ and has a slope of $\frac{4}{3}$.

$$M_y = \frac{1+(-5)}{2} = -2$$

$$m = \frac{1-(-5)}{-1-7} = -\frac{3}{4}$$



$$y - y_M = m(x - x_M).$$

$$y - 1 = \frac{4}{3}(x - 2)$$

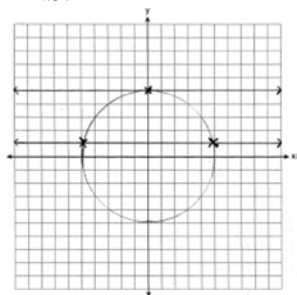
PTS: 4

REF: 080935ge

STA: G.G.68

TOP: Perpendicular Bisector

36 ANS:



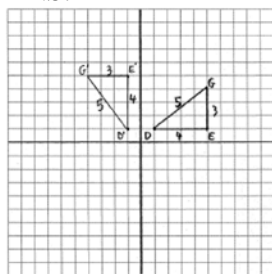
PTS: 4

REF: 080936ge

STA: G.G.23

TOP: Locus

37 ANS:



$D'(-1, 1), E'(-1, 5), G'(-4, 5)$

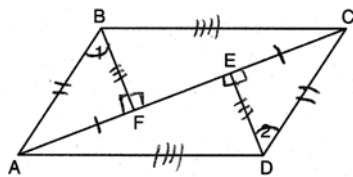
PTS: 4

REF: 080937ge

STA: G.G.55

TOP: Properties of Transformations

38 ANS:



$\overline{FE} \cong \overline{FE}$ (Reflexive Property); $\overline{AE} - \overline{FE} \cong \overline{FC} - \overline{EF}$ (Line Segment Subtraction Theorem); $\overline{AF} \cong \overline{CE}$ (Substitution); $\angle BFA \cong \angle DEC$ (All right angles are congruent); $\triangle BFA \cong \triangle DEC$ (AAS); $\overline{AB} \cong \overline{CD}$ and $\overline{BF} \cong \overline{DE}$ (CPCTC); $\angle BFC \cong \angle DEA$ (All right angles are congruent); $\triangle BFC \cong \triangle DEA$ (SAS); $\overline{AD} \cong \overline{CB}$ (CPCTC); $ABCD$ is a parallelogram (opposite sides of quadrilateral $ABCD$ are congruent)

PTS: 6

REF: 080938ge

STA: G.G.41

TOP: Special Quadrilaterals

0110ge
Answer Section

1 ANS: 2

The length of the midsegment of a trapezoid is the average of the lengths of its bases. $\frac{x+30}{2} = 44.$

$$x + 30 = 88$$

$$x = 58$$

PTS: 2 REF: 011001ge STA: G.G.40 TOP: Trapezoids

2 ANS: 1

$$x + 2x + 2 + 3x + 4 = 180$$

$$6x + 6 = 180$$

$$x = 29$$

PTS: 2 REF: 011002ge STA: G.G.30 TOP: Interior and Exterior Angles of Triangles

3 ANS: 2 PTS: 2 REF: 011003ge STA: G.G.55

TOP: Properties of Transformations

4 ANS: 2 PTS: 2 REF: 011004ge STA: G.G.17

TOP: Constructions

5 ANS: 1

The closer a chord is to the center of a circle, the longer the chord.

PTS: 2 REF: 011005ge STA: G.G.49 TOP: Chords

6 ANS: 2 PTS: 2 REF: 011006ge STA: G.G.56

TOP: Isometries

7 ANS: 3 PTS: 2 REF: 011007ge STA: G.G.31

TOP: Isosceles Triangle Theorem

8 ANS: 4

$$x^2 = (4 + 5) \times 4$$

$$x^2 = 36$$

$$x = 6$$

PTS: 2 REF: 011008ge STA: G.G.53 TOP: Segments Intercepted by Circle

KEY: tangent and secant

9 ANS: 4 PTS: 2 REF: 011009ge STA: G.G.19

TOP: Constructions

10 ANS: 3 PTS: 2 REF: 011010ge STA: G.G.71

TOP: Equations of Circles

11 ANS: 2 PTS: 2 REF: 011011ge STA: G.G.22

TOP: Locus

12 ANS: 4 PTS: 2 REF: 011012ge STA: G.G.1

TOP: Planes

13 ANS: 1

Opposite sides of a parallelogram are congruent. $4x - 3 = x + 3$. $SV = (2) + 3 = 5$.

$$3x = 6$$

$$x = 2$$

PTS: 2

REF: 011013ge

STA: G.G.38

TOP: Parallelograms

14 ANS: 3

$$m = \frac{-A}{B} = \frac{5}{2}, m = \frac{-A}{B} = \frac{10}{4} = \frac{5}{2}$$

PTS: 2

REF: 011014ge

STA: G.G.63

TOP: Parallel and Perpendicular Lines

15 ANS: 2

$$\frac{87+35}{2} = \frac{122}{2} = 61$$

PTS: 2

REF: 011015ge

STA: G.G.51

TOP: Arcs Determined by Angles

KEY: inside circle

16 ANS: 1

$$a^2 + (5\sqrt{2})^2 = (2\sqrt{15})^2$$

$$a^2 + (25 \times 2) = 4 \times 15$$

$$a^2 + 50 = 60$$

$$a^2 = 10$$

$$a = \sqrt{10}$$

PTS: 2

REF: 011016ge

STA: G.G.48

TOP: Pythagorean Theorem

17 ANS: 4

$$d = \sqrt{(-3-1)^2 + (2-0)^2} = \sqrt{16+4} = \sqrt{20} = \sqrt{4} \cdot \sqrt{5} = 2\sqrt{5}$$

PTS: 2

REF: 011017ge

STA: G.G.67

TOP: Distance

18 ANS: 4

The slope of $y = -3x + 2$ is -3 . The perpendicular slope is $\frac{1}{3}$. $-1 = \frac{1}{3}(3) + b$

$$-1 = 1 + b$$

$$b = -2$$

PTS: 2

REF: 011018ge

STA: G.G.64

TOP: Parallel and Perpendicular Lines

19 ANS: 4

PTS: 2

REF: 011019ge

STA: G.G.44

TOP: Similarity Proofs

20 ANS: 2

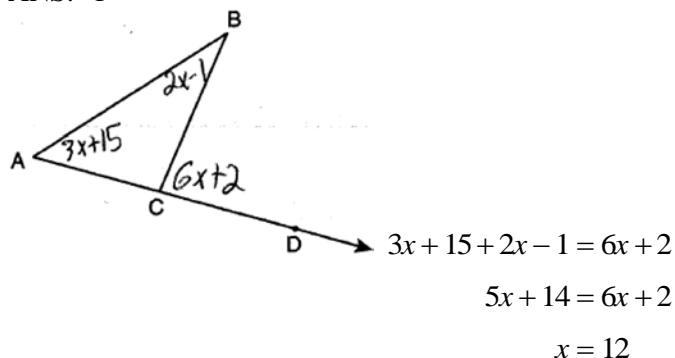
PTS: 2

REF: 011020ge

STA: G.G.74

TOP: Graphing Circles

21 ANS: 1



PTS: 2 REF: 011021ge STA: G.G.32 TOP: Exterior Angle Theorem

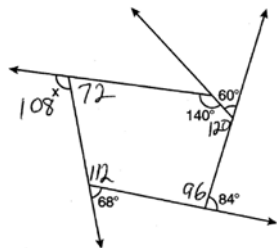
22 ANS: 2

Because the triangles are similar, $\frac{m\angle A}{m\angle D} = 1$

PTS: 2 REF: 011022ge STA: G.G.45 TOP: Similarity

KEY: perimeter and area

23 ANS: 3



PTS: 2 REF: 011023ge STA: G.G.36 TOP: Interior and Exterior Angles of Polygons

24 ANS: 1 PTS: 2 REF: 011024ge STA: G.G.3
TOP: Planes

25 ANS: 3

$$m = \frac{-A}{B} = -\frac{3}{4}$$

PTS: 2 REF: 011025ge STA: G.G.62 TOP: Parallel and Perpendicular Lines

26 ANS: 1
 $A'(2,4)$ PTS: 2 REF: 011023ge STA: G.G.54 TOP: Compositions of Transformations
KEY: basic

27 ANS: 3

$$V = \pi r^2 h = \pi \cdot 6^2 \cdot 27 = 972\pi$$

PTS: 2 REF: 011027ge STA: G.G.14 TOP: Volume

28 ANS: 3 PTS: 2 REF: 011028ge STA: G.G.26
TOP: Conditional Statements

29 ANS:

$$67. \frac{180-46}{2} = 67$$

PTS: 2

REF: 011029ge

STA: G.G.31

TOP: Isosceles Triangle Theorem

30 ANS:

$$4. l_1 w_1 h_1 = l_2 w_2 h_2$$

$$10 \times 2 \times h = 5 \times w_2 \times h$$

$$20 = 5w_2$$

$$w_2 = 4$$

PTS: 2

REF: 011030ge

STA: G.G.11

TOP: Volume

31 ANS:

$$(6, -4). C_x = \frac{Q_x + R_x}{2}. C_y = \frac{Q_y + R_y}{2}.$$

$$3.5 = \frac{1 + R_x}{2} \quad 2 = \frac{8 + R_y}{2}$$

$$7 = 1 + R_x \quad 4 = 8 + R_y$$

$$6 = R_x \quad -4 = R_y$$

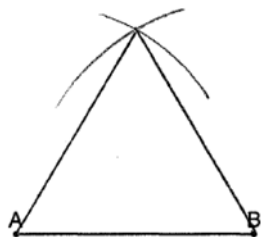
PTS: 2

REF: 011031ge

STA: G.G.66

TOP: Midpoint

32 ANS:



PTS: 2

REF: 011032ge

STA: G.G.20

TOP: Constructions

33 ANS:

$$5. \frac{3}{x} = \frac{6+3}{15}$$

$$9x = 45$$

$$x = 5$$

PTS: 2

REF: 011033ge

STA: G.G.46

TOP: Side Splitter Theorem

34 ANS:

6. The centroid divides each median into segments whose lengths are in the ratio 2 : 1. $\overline{TD} = 6$ and $\overline{DB} = 3$

PTS: 2

REF: 011034ge

STA: G.G.43

TOP: Centroid

35 ANS:

36, because a dilation does not affect angle measure. 10, because a dilation does affect distance.

PTS: 4

REF: 011035ge

STA: G.G.59

TOP: Properties of Transformations

36 ANS:

$\overline{JK} \cong \overline{LM}$ because opposite sides of a parallelogram are congruent. $\overline{LM} \cong \overline{LN}$ because of the Isosceles Triangle Theorem. $\overline{LM} \cong \overline{JM}$ because of the transitive property. $JKLM$ is a rhombus because all sides are congruent.

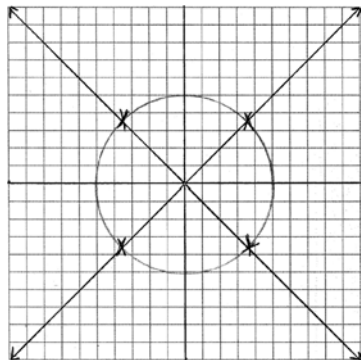
PTS: 4

REF: 011036ge

STA: G.G.41

TOP: Special Quadrilaterals

37 ANS:



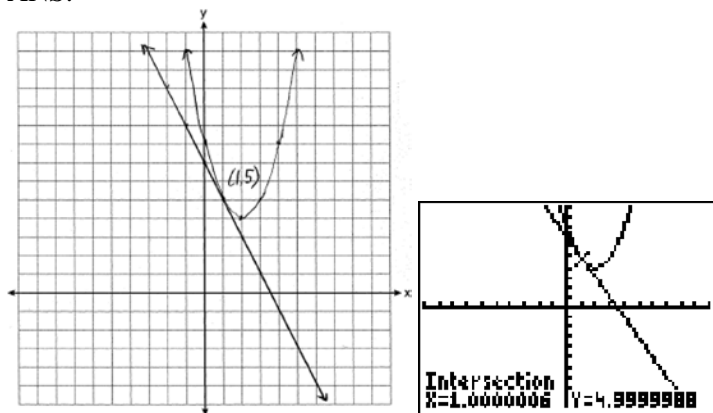
PTS: 4

REF: 011037ge

STA: G.G.23

TOP: Locus

38 ANS:



PTS: 6

REF: 011038ge

STA: G.G.70

TOP: Quadratic-Linear Systems

0610ge Answer Section

1 ANS: 1

Parallel lines intercept congruent arcs.

PTS: 2 REF: 061001ge STA: G.G.52 TOP: Chords

2 ANS: 2 PTS: 2 REF: 061002ge STA: G.G.24
TOP: Negations3 ANS: 4 PTS: 2 REF: 061003ge STA: G.G.10
TOP: Solids4 ANS: 3 PTS: 2 REF: 061004ge STA: G.G.31
TOP: Isosceles Triangle Theorem5 ANS: 1 PTS: 2 REF: 061005ge STA: G.G.55
TOP: Properties of Transformations

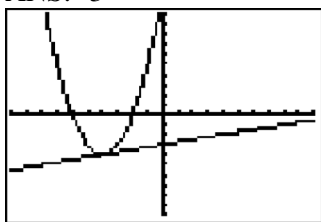
6 ANS: 4

$$L = 2\pi rh = 2\pi \cdot 5 \cdot 11 \approx 345.6$$

PTS: 2 REF: 061006ge STA: G.G.14 TOP: Volume

7 ANS: 2 PTS: 2 REF: 061007ge STA: G.G.35
TOP: Parallel Lines and Transversals8 ANS: 4 PTS: 2 REF: 061008ge STA: G.G.40
TOP: Trapezoids9 ANS: 1 PTS: 2 REF: 061009ge STA: G.G.26
TOP: Converse10 ANS: 1 PTS: 2 REF: 061010ge STA: G.G.34
TOP: Angle Side Relationship

11 ANS: 3



PTS: 2 REF: 061011ge STA: G.G.70 TOP: Quadratic-Linear Systems

12 ANS: 1 PTS: 2 REF: 061012ge STA: G.G.20
TOP: Constructions13 ANS: 1 PTS: 2 REF: 061013ge STA: G.G.50
TOP: Tangents KEY: point of tangency

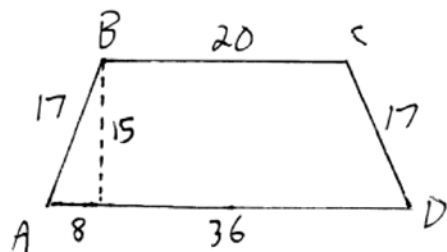
14 ANS: 4

The radius is 4. $r^2 = 16$.

PTS: 2 REF: 061014ge STA: G.G.72 TOP: Equations of Circles

15 ANS: 4 PTS: 2 REF: 061015ge STA: G.G.56
TOP: Identifying Transformations

16 ANS: 3



$$\frac{36-20}{2} = 8. \quad \sqrt{17^2 - 8^2} = 15$$

PTS: 2

REF: 061016ge

STA: G.G.40

TOP: Trapezoids

17 ANS: 3

PTS: 2

REF: 061017ge

STA: G.G.1

TOP: Planes

18 ANS: 4

PTS: 2

REF: 061018ge

STA: G.G.56

TOP: Identifying Transformations

19 ANS: 3

$$\frac{36+20}{2} = 28$$

PTS: 2

REF: 061019ge

STA: G.G.51

TOP: Arcs Determined by Angles

KEY: inside circle

20 ANS: 2

PTS: 2

REF: 061020ge

STA: G.G.19

TOP: Constructions

21 ANS: 4

$$d = \sqrt{(146 - (-4))^2 + (52 - 2)^2} = \sqrt{25,000} \approx 158.1$$

PTS: 2

REF: 061021ge

STA: G.G.67

TOP: Distance

22 ANS: 2

PTS: 2

REF: 061022ge

STA: G.G.62

TOP: Parallel and Perpendicular Lines

23 ANS: 2

$$(d+4)4 = 12(6)$$

$$4d + 16 = 72$$

$$d = 14$$

$$r = 7$$

PTS: 2

REF: 061023ge

STA: G.G.53

TOP: Segments Intercepted by Circle

KEY: two secants

24 ANS: 2

$$x^2 + (x+7)^2 = 13^2$$

$$x^2 + x^2 + 7x + 7x + 49 = 169$$

$$2x^2 + 14x - 120 = 0$$

$$x^2 + 7x - 60 = 0$$

$$(x+12)(x-5) = 0$$

$$x = 5$$

$$2x = 10$$

PTS: 2 REF: 061024ge STA: G.G.48 TOP: Pythagorean Theorem

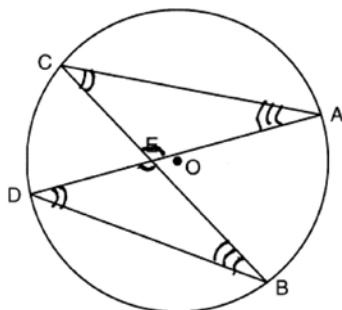
25 ANS: 4

\overline{BG} is also an angle bisector since it intersects the concurrence of \overline{CD} and \overline{AE}

PTS: 2 REF: 061025ge STA: G.G.21

KEY: Centroid, Orthocenter, Incenter and Circumcenter

26 ANS: 2



PTS: 2 REF: 061026GE STA: G.G.51 TOP: Arcs Determined by Angles

KEY: inscribed

27 ANS: 1

$$-2\left(-\frac{1}{2}y = 6x + 10\right)$$

$$y = -12x - 20$$

PTS: 2 REF: 061027ge STA: G.G.63 TOP: Parallel and Perpendicular Lines

28 ANS: 2

Adjacent sides of a rectangle are perpendicular and have opposite and reciprocal slopes.

PTS: 2 REF: 061028ge STA: G.G.69 TOP: Quadrilaterals in the Coordinate Plane

29 ANS:

$$452. SA = 4\pi r^2 = 4\pi \cdot 6^2 = 144\pi \approx 452$$

PTS: 2 REF: 061029ge STA: G.G.16 TOP: Volume and Surface Area

30 ANS:

37. Since \overline{DE} is a midsegment, $AC = 14$. $10 + 13 + 14 = 37$

PTS: 2

REF: 061030ge

STA: G.G.42

TOP: Midsegments

31 ANS:

$$34. 2x - 12 + x + 90 = 180$$

$$3x + 78 = 90$$

$$3x = 102$$

$$x = 34$$

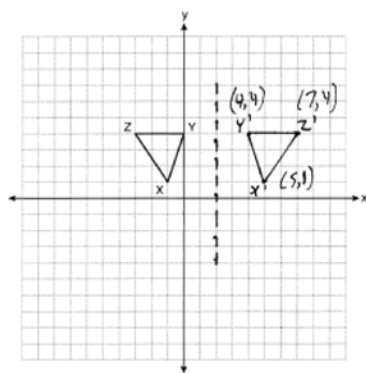
PTS: 2

REF: 061031ge

STA: G.G.30

TOP: Interior and Exterior Angles of Triangles

32 ANS:



PTS: 2

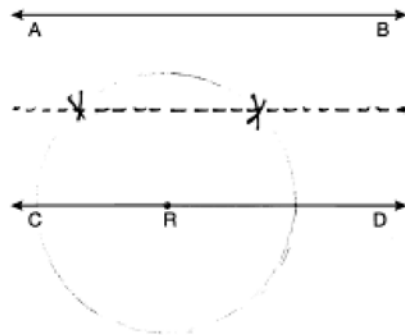
REF: 061032ge

STA: G.G.54

TOP: Reflections

KEY: grids

33 ANS:



PTS: 2

REF: 061033ge

STA: G.G.22

TOP: Locus

34 ANS:

$$18. \quad V = \frac{1}{3} Bh = \frac{1}{3} lwh$$

$$288 = \frac{1}{3} \cdot 8 \cdot 6 \cdot h$$

$$288 = 16h$$

$$18 = h$$

PTS: 2

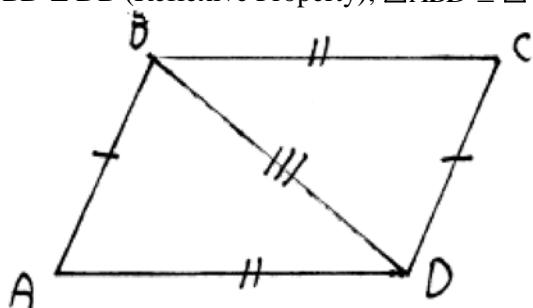
REF: 061034ge

STA: G.G.13

TOP: Volume

35 ANS:

$\overline{BD} \cong \overline{DB}$ (Reflexive Property); $\triangle ABD \cong \triangle CDB$ (SSS); $\angle BDC \cong \angle ABD$ (CPCTC).



PTS: 4

REF: 061035ge

STA: G.G.27

TOP: Quadrilateral Proofs

36 ANS:

$$y = \frac{2}{3}x + 1. \quad 2y + 3x = 6 \quad . \quad y = mx + b$$

$$2y = -3x + 6 \quad 5 = \frac{2}{3}(6) + b$$

$$y = -\frac{3}{2}x + 3 \quad 5 = 4 + b$$

$$m = -\frac{3}{2} \quad 1 = b$$

$$m_{\perp} = \frac{2}{3} \quad y = \frac{2}{3}x + 1$$

PTS: 4

REF: 061036ge

STA: G.G.64

TOP: Parallel and Perpendicular Lines

37 ANS:

$$\text{Midpoint: } \left(\frac{-4+4}{2}, \frac{2+(-4)}{2} \right) = (0, -1). \text{ Distance: } d = \sqrt{(-4-4)^2 + (2-(-4))^2} = \sqrt{100} = 10$$

$$r = 5$$

$$r^2 = 25$$

$$x^2 + (y+1)^2 = 25$$

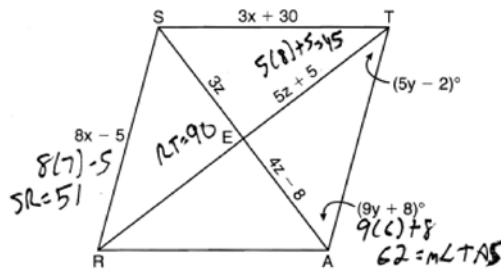
PTS: 2

REF: 061037ge

STA: G.G.71

TOP: Equations of Circles

38 ANS:



$$8x - 5 = 3x + 30. \quad 4z - 8 = 3z. \quad 9y + 8 + 5y - 2 = 90.$$

$$5x = 35 \quad z = 8 \quad 14y + 6 = 90$$

$$x = 7 \quad 14y = 84$$

$$y = 6$$

PTS: 6

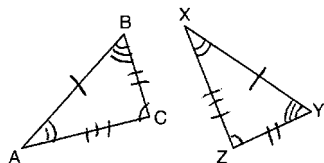
REF: 061038ge

STA: G.G.39

TOP: Special Parallelograms

0810ge
Answer Section

1 ANS: 4



PTS: 2

REF: 081001ge

STA: G.G.29

TOP: Triangle Congruency

2 ANS: 3

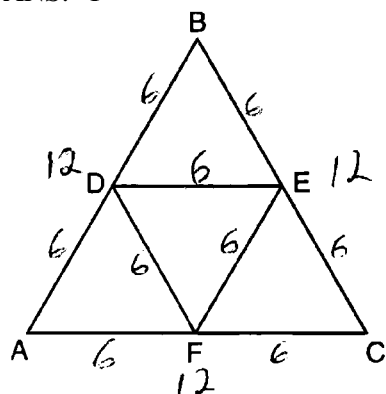
PTS: 2

REF: 081002ge

STA: G.G.9

TOP: Planes

3 ANS: 1



PTS: 2

REF: 081003ge

STA: G.G.42

TOP: Midsegments

4 ANS: 3

$$(x+3)^2 - 4 = 2x + 5$$

$$x^2 + 6x + 9 - 4 = 2x + 5$$

$$x^2 + 4x = 0$$

$$x(x+4) = 0$$

$$x = 0, -4$$

PTS: 2

REF: 081004ge

STA: G.G.70

TOP: Quadratic-Linear Systems

5 ANS: 4

PTS: 2

REF: 081005ge

STA: G.G.18

TOP: Constructions

6 ANS: 4

$$180 - (50 + 30) = 100$$

PTS: 2

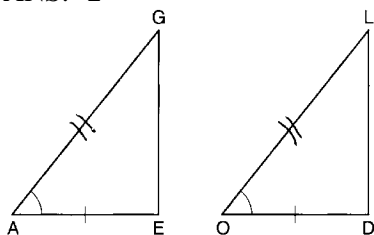
REF: 081006ge

STA: G.G.45

TOP: Similarity

KEY: basic

7 ANS: 2



PTS: 2 REF: 081007ge STA: G.G.28 TOP: Triangle Congruency

8 ANS: 1 PTS: 2 REF: 081008ge STA: G.G.3

TOP: Planes

9 ANS: 1 PTS: 2 REF: 081009ge STA: G.G.73

TOP: Equations of Circles

10 ANS: 4

The slope of a line in standard form is $-\frac{A}{B}$, so the slope of this line is $\frac{-4}{2} = -2$. A parallel line would also have a slope of -2 . Since the answers are in slope intercept form, find the y -intercept: $y = mx + b$

$$3 = -2(7) + b$$

$$17 = b$$

PTS: 2 REF: 081010ge STA: G.G.65 TOP: Parallel and Perpendicular Lines

11 ANS: 4

Longest side of a triangle is opposite the largest angle. Shortest side is opposite the smallest angle.

PTS: 2 REF: 081011ge STA: G.G.34 TOP: Angle Side Relationship

12 ANS: 1 PTS: 2 REF: 081012ge STA: G.G.50

TOP: Tangents KEY: two tangents

13 ANS: 4

$$d = \sqrt{(-6-2)^2 + (4-(-5))^2} = \sqrt{64+81} = \sqrt{145}$$

PTS: 2 REF: 081013ge STA: G.G.67 TOP: Distance

14 ANS: 2

$$y + \frac{1}{2}x = 4 \quad 3x + 6y = 12$$

$$y = -\frac{1}{2}x + 4 \quad 6y = -3x + 12$$

$$m = -\frac{1}{2} \quad y = -\frac{3}{6}x + 2$$

$$y = -\frac{1}{2}x + 2$$

PTS: 2 REF: 081014ge STA: G.G.63 TOP: Parallel and Perpendicular Lines

15 ANS: 2 PTS: 2 REF: 081015ge STA: G.G.55

TOP: Properties of Transformations

16 ANS: 4

sum of interior \angle s = sum of exterior \angle s

$$(n-2)180 = n \left(180 - \frac{(n-2)180}{n} \right)$$

$$180n - 360 = 180n - 180n + 360$$

$$180n = 720$$

$$n = 4$$

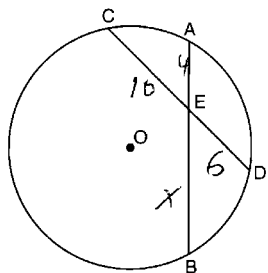
PTS: 2

REF: 081016ge

STA: G.G.36

TOP: Interior and Exterior Angles of Polygons

17 ANS: 1



$$4x = 6 \cdot 10$$

$$x = 15$$

PTS: 2

REF: 081017ge

STA: G.G.53

TOP: Segments Intercepted by Circle

KEY: two chords

18 ANS: 1

The centroid divides each median into segments whose lengths are in the ratio 2 : 1.

$$\overline{GC} = 2\overline{FG}$$

$$\overline{GC} + \overline{FG} = 24$$

$$2\overline{FG} + \overline{FG} = 24$$

$$3\overline{FG} = 24$$

$$\overline{FG} = 8$$

PTS: 2

REF: 081018ge

STA: G.G.43

TOP: Centroid

19 ANS: 2

$$M_x = \frac{3x+5+x-1}{2} = \frac{4x+4}{2} = 2x+2. \quad M_y = \frac{3y+(-y)}{2} = \frac{2y}{2} = y.$$

PTS: 2

REF: 081019ge

STA: G.G.66

TOP: Midpoint

20 ANS: 4

$$SA = 4\pi r^2 \quad V = \frac{4}{3}\pi r^3 = \frac{4}{3}\pi \cdot 6^3 = 288\pi$$

$$144\pi = 4\pi r^2$$

$$36 = r^2$$

$$6 = r$$

PTS: 2 REF: 081020ge STA: G.G.16 TOP: Volume and Surface Area

21 ANS: 3 PTS: 2 REF: 081021ge STA: G.G.57

TOP: Properties of Transformations

22 ANS: 1

$$\angle A = \frac{(n-2)180}{n} = \frac{(5-2)180}{5} = 108 \quad \angle AEB = \frac{180-108}{2} = 36$$

PTS: 2 REF: 081022ge STA: G.G.37 TOP: Interior and Exterior Angles of Polygons

23 ANS: 4 PTS: 2 REF: 081023ge STA: G.G.45

TOP: Similarity KEY: perimeter and area

24 ANS: 3

$2y = -6x + 8$ Perpendicular lines have slope the opposite and reciprocal of each other.

$$y = -3x + 4$$

$$m = -3$$

$$m_{\perp} = \frac{1}{3}$$

PTS: 2 REF: 081024ge STA: G.G.62 TOP: Parallel and Perpendicular Lines

25 ANS: 2

$$\frac{140 - \overline{RS}}{2} = 40$$

$$140 - \overline{RS} = 80$$

$$\overline{RS} = 60$$

PTS: 2 REF: 081025ge STA: G.G.51 TOP: Arcs Determined by Angles

KEY: outside circle

26 ANS: 3 PTS: 2 REF: 081026ge STA: G.G.26

TOP: Contrapositive

27 ANS: 2

$$\frac{3}{7} = \frac{6}{x}$$

$$3x = 42$$

$$x = 14$$

PTS: 2 REF: 081027ge STA: G.G.46 TOP: Side Splitter Theorem

28 ANS: 1 PTS: 2 REF: 081028ge STA: G.G.21
 TOP: Centroid, Orthocenter, Incenter and Circumcenter

29 ANS:
 70. $3x + 5 + 3x + 5 + 2x + 2x = 180$
 $10x + 10 = 360$
 $10x = 350$
 $x = 35$
 $2x = 70$

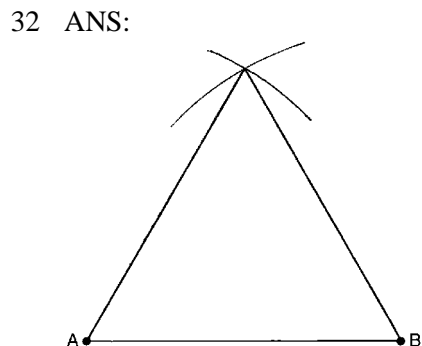
PTS: 2 REF: 081029ge STA: G.G.40 TOP: Trapezoids

30 ANS:
 $375\pi L = \pi r l = \pi(15)(25) = 375\pi$

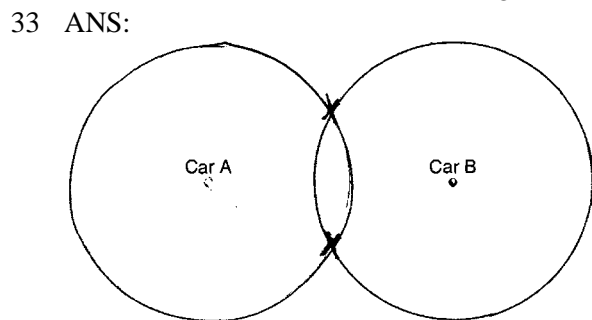
PTS: 2 REF: 081030ge STA: G.G.15 TOP: Volume and Lateral Area

31 ANS:
 110. $6x + 20 = x + 40 + 4x - 5$
 $6x + 20 = 5x + 35$
 $x = 15$
 $6((15) + 20 = 110$

PTS: 2 REF: 081031ge STA: G.G.31 TOP: Isosceles Triangle Theorem



PTS: 2 REF: 081032ge STA: G.G.20 TOP: Constructions



PTS: 2 REF: 081033ge STA: G.G.22 TOP: Locus

34 ANS:

$$(x+1)^2 + (y-2)^2 = 36$$

PTS: 2

REF: 081034ge

STA: G.G.72

TOP: Equations of Circles

35 ANS:

Yes, $m\angle ABD = m\angle BDC = 44$ $180 - (93 + 43) = 44$ $x + 19 + 2x + 6 + 3x + 5 = 180$. Because alternate interior

$$6x + 30 = 180$$

$$6x = 150$$

$$x = 25$$

$$x + 19 = 44$$

angles $\angle ABD$ and $\angle CDB$ are congruent, \overline{AB} is parallel to \overline{DC} .

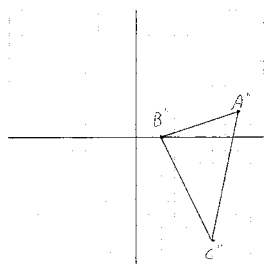
PTS: 4

REF: 081035ge

STA: G.G.35

TOP: Parallel Lines and Transversals

36 ANS:



$$A''(8,2), B''(2,0), C''(6,-8)$$

PTS: 4

REF: 081036ge

STA: G.G.58

TOP: Compositions of Transformations

37 ANS:

$$2.4. \quad 5a = 4^2 \quad 5b = 3^2 \quad h^2 = ab$$

$$a = 3.2 \quad b = 1.8 \quad h^2 = 3.2 \cdot 1.8$$

$$h = \sqrt{5.76} = 2.4$$

PTS: 4

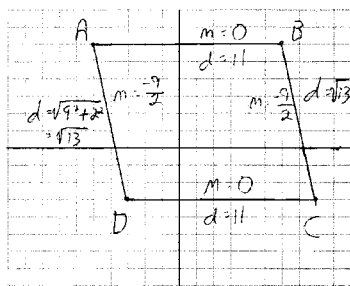
REF: 081037ge

STA: G.G.47

TOP: Similarity

KEY: altitude

38 ANS:



$\overline{AB} \parallel \overline{CD}$ and $\overline{AD} \parallel \overline{CB}$ because their slopes are equal. $ABCD$ is a parallelogram because opposite sides are parallel. $\overline{AB} \neq \overline{BC}$. $ABCD$ is not a rhombus because all sides are not equal. $\overline{AB} \not\perp \overline{BC}$ because their slopes are not opposite reciprocals. $ABCD$ is not a rectangle because $\angle ABC$ is not a right angle.

PTS: 4

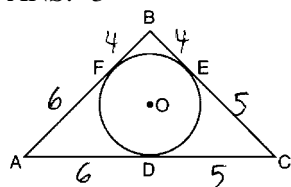
REF: 081038ge

STA: G.G.69

TOP: Quadrilaterals in the Coordinate Plane

0111ge Answer Section

1 ANS: 3



PTS: 2 REF: 011101ge STA: G.G.53 TOP: Segments Intercepted by Circle
KEY: two tangents

2 ANS: 1 PTS: 2 REF: 011102ge STA: G.G.55
TOP: Properties of Transformations

3 ANS: 2
$$\frac{4x + 10}{2} = 2x + 5$$

PTS: 2 REF: 011103ge STA: G.G.42 TOP: Midsegments
4 ANS: 3 PTS: 2 REF: 011104ge STA: G.G.38
TOP: Parallelograms

5 ANS: 3 PTS: 2 REF: 011105ge STA: G.G.10
TOP: Solids

6 ANS: 2
$$M_x = \frac{7 + (-3)}{2} = 2. \quad M_y = \frac{-1 + 3}{2} = 1.$$

PTS: 2 REF: 011106ge STA: G.G.66 TOP: Midpoint

7 ANS: 3
 $-5 + 3 = -2 \quad 2 + -4 = -2$

PTS: 2 REF: 011107ge STA: G.G.54 TOP: Translations

8 ANS: 4 PTS: 2 REF: 011108ge STA: G.G.27
TOP: Angle Proofs

9 ANS: 2 PTS: 2 REF: 011109ge STA: G.G.9
TOP: Planes

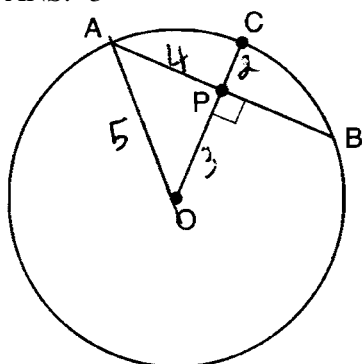
10 ANS: 3 PTS: 2 REF: 011110ge STA: G.G.21
KEY: Centroid, Orthocenter, Incenter and Circumcenter

11 ANS: 3
 $8^2 + 24^2 \neq 25^2$

PTS: 2 REF: 011111ge STA: G.G.48 TOP: Pythagorean Theorem

12 ANS: 1 PTS: 2 REF: 011112ge STA: G.G.39
TOP: Special Parallelograms

13 ANS: 3



PTS: 2 REF: 011112ge STA: G.G.49 TOP: Chords

14 ANS: 4

$$y = mx + b$$

$$3 = \frac{3}{2}(-2) + b$$

$$3 = -3 + b$$

$$6 = b$$

PTS: 2 REF: 011114ge STA: G.G.65 TOP: Parallel and Perpendicular Lines

15 ANS: 4

$$m\angle A = 80$$

PTS: 2 REF: 011115ge STA: G.G.34 TOP: Angle Side Relationship

16 ANS: 3

PTS: 2

REF: 011116ge

STA: G.G.71

TOP: Equations of Circles

17 ANS: 2

$$V = \pi r^2 h = \pi \cdot 6^2 \cdot 15 = 540\pi$$

PTS: 2 REF: 011117ge STA: G.G.14 TOP: Volume

18 ANS: 4

PTS: 2

REF: 011118ge

STA: G.G.25

TOP: Compound Statements

KEY: general

19 ANS: 4

$$x + 6y = 12$$

$$3(x - 2) = -y - 4$$

$$6y = -x + 12$$

$$-3(x - 2) = y + 4$$

$$y = -\frac{1}{6}x + 2$$

$$m = -3$$

$$m = -\frac{1}{6}$$

PTS: 2 REF: 011119ge STA: G.G.63 TOP: Parallel and Perpendicular Lines

20 ANS: 1

PTS: 2

REF: 011120ge

STA: G.G.18

TOP: Constructions

21 ANS: 4

$$d = \sqrt{(-5-3)^2 + (4-(-6))^2} = \sqrt{64+100} = \sqrt{164} = \sqrt{4 \cdot 41} = 2\sqrt{41}$$

PTS: 2 REF: 011121ge STA: G.G.67 TOP: Distance
KEY: general

22 ANS: 1 PTS: 2 REF: 011122GE STA: G.G.28
TOP: Triangle Congruency

23 ANS: 4
 $6^2 = x(x+5)$

$$36 = x^2 + 5x$$

$$0 = x^2 + 5x - 36$$

$$0 = (x+9)(x-4)$$

$$x = 4$$

PTS: 2 REF: 011123ge STA: G.G.47 TOP: Similarity
KEY: leg

24 ANS: 4 PTS: 2 REF: 011124ge STA: G.G.51
TOP: Arcs Determined by Angles KEY: inscribed

25 ANS: 2 PTS: 2 REF: 011125ge STA: G.G.74
TOP: Graphing Circles

26 ANS: 3
 $(3, -2) \rightarrow (2, 3) \rightarrow (8, 12)$

PTS: 2 REF: 011126ge STA: G.G.54 TOP: Compositions of Transformations
KEY: basic

27 ANS: 3
 $x + 2x + 15 = 5x + 15$ $2(5) + 15 = 25$

$$3x + 15 = 5x + 5$$

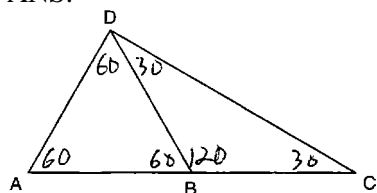
$$10 = 2x$$

$$5 = x$$

PTS: 2 REF: 011127ge STA: G.G.32 TOP: Exterior Angle Theorem

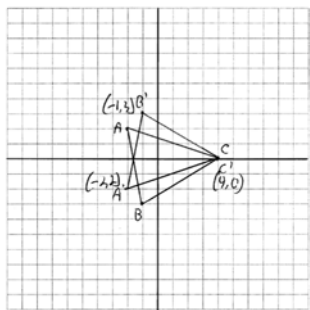
28 ANS: 1 PTS: 2 REF: 011128ge STA: G.G.2
TOP: Planes

29 ANS:



PTS: 2 REF: 011129ge STA: G.G.31 TOP: Isosceles Triangle Theorem

30 ANS:



PTS: 2

REF: 011130ge

STA: G.G.54

TOP: Reflections

KEY: grids

31 ANS:

$$(5 - 2)180 = 540. \frac{540}{5} = 108 \text{ interior. } 180 - 108 = 72 \text{ exterior}$$

PTS: 2

REF: 011131ge

STA: G.G.37

TOP: Interior and Exterior Angles of Polygons

32 ANS:

$$x^2 = 9 \cdot 8$$

$$x = \sqrt{72}$$

$$x = \sqrt{36} \sqrt{2}$$

$$x = 6\sqrt{2}$$

PTS: 2

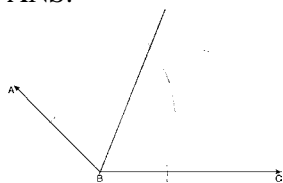
REF: 011132ge

STA: G.G.53

TOP: Segments Intercepted by Circle

KEY: two chords

33 ANS:



PTS: 2

REF: 011133ge

STA: G.G.17

TOP: Constructions

34 ANS:

$$m = \frac{-A}{B} = \frac{6}{2} = 3. \quad m_{\perp} = -\frac{1}{3}.$$

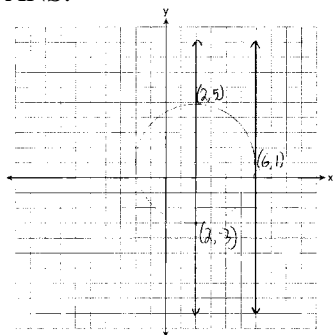
PTS: 2

REF: 011134ge

STA: G.G.62

TOP: Parallel and Perpendicular Lines

35 ANS:



PTS: 4 REF: 011135ge STA: G.G.23 TOP: Locus

36 ANS:

$\angle B$ and $\angle E$ are right angles because of the definition of perpendicular lines. $\angle B \cong \angle E$ because all right angles are congruent. $\angle BFD$ and $\angle DFE$ are supplementary and $\angle ECA$ and $\angle ACB$ are supplementary because of the definition of supplementary angles. $\angle DFE \cong \angle ACB$ because angles supplementary to congruent angles are congruent. $\triangle ABC \sim \triangle DEF$ because of AA.

PTS: 4 REF: 011136ge STA: G.G.44 TOP: Similarity Proofs

37 ANS:

$$32. \quad \frac{16}{20} = \frac{x-3}{x+5} \quad \cdot \quad \overline{AC} = x-3 = 35-3 = 32$$

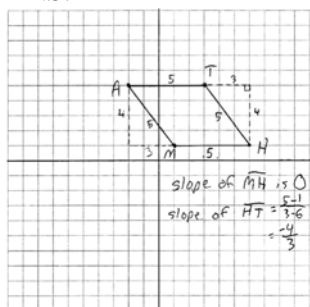
$$16x + 80 = 20x - 60$$

$$140 = 4x$$

$$35 = x$$

PTS: 4 REF: 011137ge STA: G.G.46 TOP: Side Splitter Theorem

38 ANS:



The length of each side of quadrilateral is 5. Since each side is congruent, quadrilateral $MATH$ is a rhombus. The slope of \overline{MH} is 0 and the slope of \overline{HT} is $-\frac{4}{5}$. Since the slopes are not negative reciprocals, the sides are not perpendicular and do not form right angles. Since adjacent sides are not perpendicular, quadrilateral $MATH$ is not a square.

PTS: 6 REF: 011138ge STA: G.G.69 TOP: Quadrilaterals in the Coordinate Plane

0611ge
Answer Section

- 1 ANS: 2 PTS: 2 REF: 061101ge STA: G.G.18
TOP: Constructions
- 2 ANS: 3 PTS: 2 REF: 061102ge STA: G.G.29
TOP: Triangle Congruency
- 3 ANS: 4 PTS: 2 REF: 061103ge STA: G.G.60
TOP: Identifying Transformations
- 4 ANS: 1 PTS: 2 REF: 061104ge STA: G.G.43
TOP: Centroid
- 5 ANS: 1
Parallel lines intercept congruent arcs.
- PTS: 2 REF: 061105ge STA: G.G.52 TOP: Chords
- 6 ANS: 2
 $7x = 5x + 30$
 $2x = 30$
 $x = 15$
- PTS: 2 REF: 061106ge STA: G.G.35 TOP: Parallel Lines and Transversals
- 7 ANS: 2 PTS: 2 REF: 061107ge STA: G.G.32
TOP: Exterior Angle Theorem
- 8 ANS: 1 PTS: 2 REF: 061108ge STA: G.G.9
TOP: Planes
- 9 ANS: 2
 $d = \sqrt{(-1 - 7)^2 + (9 - 4)^2} = \sqrt{64 + 25} = \sqrt{89}$
- PTS: 2 REF: 061109ge STA: G.G.67 TOP: Distance
KEY: general
- 10 ANS: 1 PTS: 2 REF: 061110ge STA: G.G.72
TOP: Equations of Circles
- 11 ANS: 3 PTS: 2 REF: 061111ge STA: G.G.38
TOP: Parallelograms
- 12 ANS: 2
 $V = \frac{4}{3} \pi r^3 = \frac{4}{3} \pi \cdot 3^3 = 36\pi$
- PTS: 2 REF: 061112ge STA: G.G.16 TOP: Volume and Surface Area
- 13 ANS: 1 PTS: 2 REF: 061113ge STA: G.G.63
TOP: Parallel and Perpendicular Lines
- 14 ANS: 4 PTS: 2 REF: 061114ge STA: G.G.73
TOP: Equations of Circles
- 15 ANS: 2 PTS: 2 REF: 061115ge STA: G.G.69
TOP: Triangles in the Coordinate Plane

16 ANS: 3
 $\sqrt{5^2 + 12^2} = 13$

PTS: 2 REF: 061116ge STA: G.G.39 TOP: Special Parallelograms

17 ANS: 4
 $4(x+4) = 8^2$
 $4x + 16 = 64$
 $4x = 48$
 $x = 12$

PTS: 2 REF: 061117ge STA: G.G.53 TOP: Segments Intercepted by Circle
 KEY: tangent and secant

18 ANS: 4 PTS: 2 REF: 061118ge STA: G.G.1
 TOP: Planes

19 ANS: 1
 $3x + 5 + 4x - 15 + 2x + 10 = 180$. $m\angle D = 3(20) + 5 = 65$. $m\angle E = 4(20) - 15 = 65$.
 $9x = 180$
 $x = 20$

PTS: 2 REF: 061119ge STA: G.G.30 TOP: Interior and Exterior Angles of Triangles

20 ANS: 3
 $\frac{7x}{4} = \frac{7}{x}$. $7(2) = 14$
 $7x^2 = 28$
 $x = 2$

PTS: 2 REF: 061120ge STA: G.G.45 TOP: Similarity
 KEY: basic

21 ANS: 2 PTS: 2 REF: 061121ge STA: G.G.22
 TOP: Locus

22 ANS: 3 PTS: 2 REF: 061122ge STA: G.G.56
 TOP: Identifying Transformations

23 ANS: 2

The slope of a line in standard form is $-\frac{A}{B}$, so the slope of this line is $-\frac{4}{3}$. A parallel line would also have a slope of $-\frac{4}{3}$. Since the answers are in standard form, use the point-slope formula. $y - 2 = -\frac{4}{3}(x + 5)$

$$3y - 6 = -4x - 20$$

$$4x + 3y = -14$$

PTS: 2 REF: 061123ge STA: G.G.65 TOP: Parallel and Perpendicular Lines

24 ANS: 4 PTS: 2 REF: 061124ge STA: G.G.31
TOP: Isosceles Triangle Theorem

25 ANS: 1 PTS: 2 REF: 061125ge STA: G.G.39
TOP: Special Parallelograms

26 ANS: 2 PTS: 2 REF: 061126ge STA: G.G.59
TOP: Properties of Transformations

27 ANS: 4

The slope of $3x + 5y = 4$ is $m = \frac{-A}{B} = \frac{-3}{5}$. $m_{\perp} = \frac{5}{3}$.

PTS: 2 REF: 061127ge STA: G.G.62 TOP: Parallel and Perpendicular Lines

28 ANS: 1
 $x^2 = 7(16 - 7)$

$$x^2 = 63$$

$$x = \sqrt{9}\sqrt{7}$$

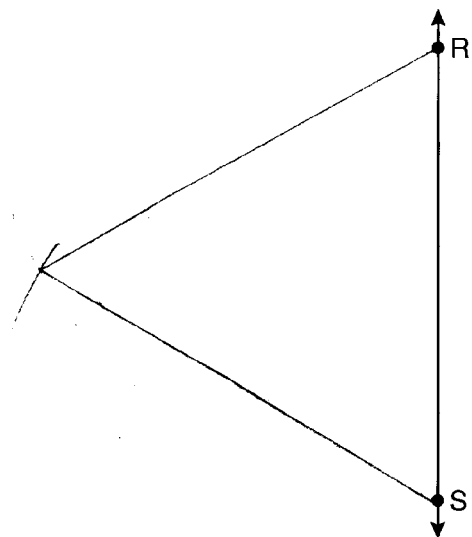
$$x = 3\sqrt{7}$$

PTS: 2 REF: 061128ge STA: G.G.47 TOP: Similarity
KEY: altitude

29 ANS:
The medians of a triangle are not concurrent. False.

PTS: 2 REF: 061129ge STA: G.G.24 TOP: Negations

30 ANS:



PTS: 2 REF: 061130ge STA: G.G.20 TOP: Constructions

31 ANS:

$$9.1. (11)(8)h = 800$$

$$h \approx 9.1$$

PTS: 2

REF: 061131ge

STA: G.G.12

TOP: Volume

32 ANS:

Yes. A reflection is an isometry.

PTS: 2

REF: 061132ge

STA: G.G.56

TOP: Identifying Transformations

33 ANS:

$$16.7. \frac{x}{25} = \frac{12}{18}$$

$$18x = 300$$

$$x \approx 16.7$$

PTS: 2

REF: 061133ge

STA: G.G.46

TOP: Side Splitter Theorem

34 ANS:

$$(2a-3, 3b+2). \left(\frac{3a+a-6}{2}, \frac{2b-1+4b+5}{2} \right) = \left(\frac{4a-6}{2}, \frac{6b+4}{2} \right) = (2a-3, 3b+2)$$

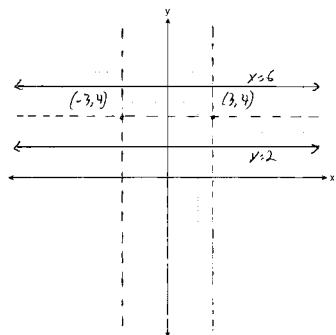
PTS: 2

REF: 061134ge

STA: G.G.66

TOP: Midpoint

35 ANS:



PTS: 4

REF: 061135ge

STA: G.G.23

TOP: Locus

36 ANS:

$$30. 3x + 4x + 5x = 360. \widehat{mLN} : \widehat{mNK} : \widehat{mKL} = 90 : 120 : 150. \frac{150-90}{2} = 30$$

$$x = 20$$

PTS: 4

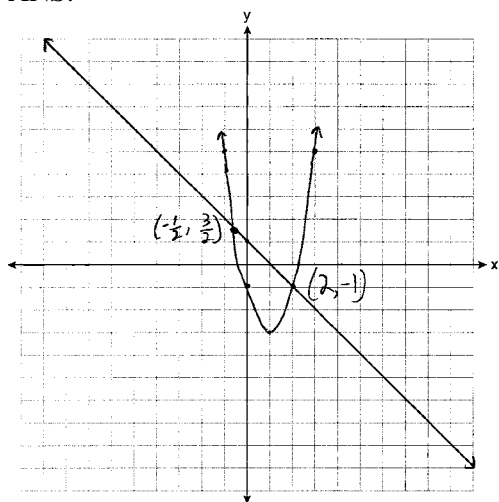
REF: 061136ge

STA: G.G.51

TOP: Arcs Determined by Angles

KEY: outside circle

37 ANS:



PTS: 4

REF: 061137ge

STA: G.G.70

TOP: Quadratic-Linear Systems

38 ANS:

$\overline{OA} \cong \overline{OB}$ because all radii are equal. $\overline{OP} \cong \overline{OP}$ because of the reflexive property. $\overline{OA} \perp \overline{PA}$ and $\overline{OB} \perp \overline{PB}$ because tangents to a circle are perpendicular to a radius at a point on a circle. $\angle PAO$ and $\angle PBO$ are right angles because of the definition of perpendicular. $\angle PAO \cong \angle PBO$ because all right angles are congruent. $\triangle AOP \cong \triangle BOP$ because of HL. $\angle AOP \cong \angle BOP$ because of CPCTC.

PTS: 5

REF: 061138ge

STA: G.G.27

TOP: Circle Proofs

0811ge
Answer Section

- 1 ANS: 4 PTS: 2 REF: 081101ge STA: G.G.25
TOP: Compound Statements KEY: conjunction
- 2 ANS: 2 PTS: 2 REF: 081102ge STA: G.G.29
TOP: Triangle Congruency
- 3 ANS: 3
 $\frac{5}{7} = \frac{10}{x}$
 $5x = 70$
 $x = 14$
- PTS: 2 REF: 081103ge STA: G.G.46 TOP: Side Splitter Theorem
- 4 ANS: 3 PTS: 2 REF: 081104ge STA: G.G.55
TOP: Properties of Transformations
- 5 ANS: 4
 $\sqrt{25^2 - 7^2} = 24$
- PTS: 2 REF: 081105ge STA: G.G.50 TOP: Tangents
KEY: point of tangency
- 6 ANS: 4 PTS: 2 REF: 081106ge STA: G.G.17
TOP: Constructions
- 7 ANS: 3
 $d = \sqrt{(1-9)^2 + (-4-2)^2} = \sqrt{64+36} = \sqrt{100} = 10$
- PTS: 2 REF: 081107ge STA: G.G.67 TOP: Distance
KEY: general
- 8 ANS: 2 PTS: 2 REF: 081108ge STA: G.G.54
TOP: Reflections KEY: basic
- 9 ANS: 3
 $7x = 5x + 30$
 $2x = 30$
 $x = 15$
- PTS: 2 REF: 081109ge STA: G.G.35 TOP: Parallel Lines and Transversals
- 10 ANS: 4 PTS: 2 REF: 081110ge STA: G.G.71
TOP: Equations of Circles
- 11 ANS: 3 PTS: 2 REF: 081111ge STA: G.G.32
TOP: Exterior Angle Theorem

12 ANS: 2

$$m = \frac{-A}{B} = \frac{-4}{2} = -2 \quad y = mx + b$$

$$2 = -2(2) + b$$

$$6 = b$$

PTS: 2

REF: 081112ge

STA: G.G.65

TOP: Parallel and Perpendicular Lines

13 ANS: 1

PTS: 2

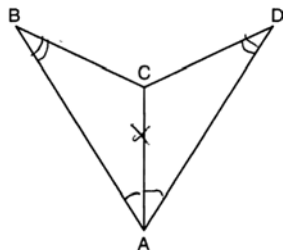
REF: 081113ge

STA: G.G.54

TOP: Reflections

KEY: basic

14 ANS: 4



PTS: 2

REF: 081114ge

STA: G.G.28

TOP: Triangle Congruency

15 ANS: 1

$$1 = \frac{-4+x}{2} \quad 5 = \frac{3+y}{2}$$

$$-4+x = 2 \quad 3+y = 10$$

$$x = 6 \quad y = 7$$

PTS: 2

REF: 081115ge

STA: G.G.66

TOP: Midpoint

16 ANS: 1

PTS: 2

REF: 081116ge

STA: G.G.7

TOP: Planes

17 ANS: 2

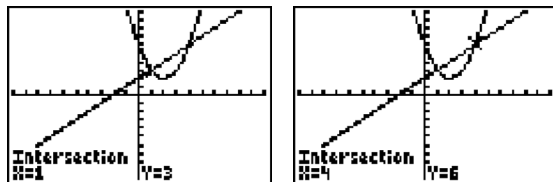
PTS: 2

REF: 081117ge

STA: G.G.23

TOP: Locus

18 ANS: 3



PTS: 2

REF: 081118ge

STA: G.G.70

TOP: Quadratic-Linear Systems

19 ANS: 4

$$\frac{5}{2+3+5} \times 180 = 90$$

PTS: 2

REF: 081119ge

STA: G.G.30

TOP: Interior and Exterior Angles of Triangles

20 ANS: 2

PTS: 2

REF: 081120ge

STA: G.G.8

TOP: Planes

21 ANS: 1 PTS: 2 REF: 081121ge STA: G.G.39
TOP: Special Parallelograms

22 ANS: 2

The slope of $x + 2y = 3$ is $m = \frac{-A}{B} = \frac{-1}{2}$. $m_{\perp} = 2$.

PTS: 2 REF: 081122ge STA: G.G.62 TOP: Parallel and Perpendicular Lines
23 ANS: 3 PTS: 2 REF: 081123ge STA: G.G.12
TOP: Volume

24 ANS: 4

$$\sqrt{6^2 - 2^2} = \sqrt{32} = \sqrt{16} \sqrt{2} = 4\sqrt{2}$$

PTS: 2 REF: 081124ge STA: G.G.49 TOP: Chords
25 ANS: 2

$$(n - 2)180 = (6 - 2)180 = 720. \frac{720}{6} = 120.$$

PTS: 2 REF: 081125ge STA: G.G.37 TOP: Interior and Exterior Angles of Polygons
26 ANS: 1

$$m = \left(\frac{8+0}{2}, \frac{2+6}{2} \right) = (4, 4) \quad m = \frac{6-2}{0-8} = \frac{4}{-8} = -\frac{1}{2} \quad m_{\perp} = 2 \quad y = mx + b$$

$$4 = 2(4) + b$$

$$-4 = b$$

PTS: 2 REF: 081126ge STA: G.G.68 TOP: Perpendicular Bisector
27 ANS: 3

$$x^2 + 7^2 = (x + 1)^2 \quad x + 1 = 25$$

$$x^2 + 49 = x^2 + 2x + 1$$

$$48 = 2x$$

$$24 = x$$

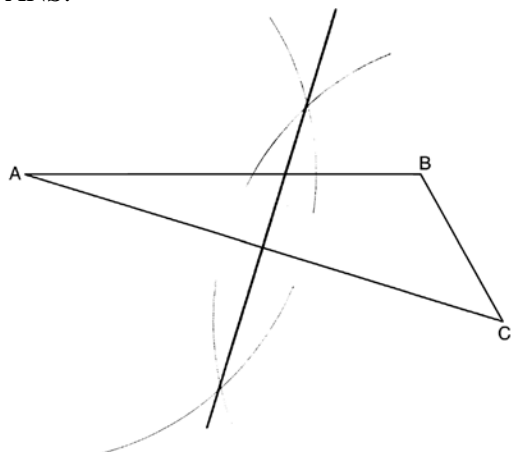
PTS: 2 REF: 081127ge STA: G.G.48 TOP: Pythagorean Theorem
28 ANS: 3 PTS: 2 REF: 081128ge STA: G.G.39
TOP: Special Parallelograms

29 ANS:

$$\frac{180 - 80}{2} = 50$$

PTS: 2 REF: 081129ge STA: G.G.52 TOP: Chords

30 ANS:



PTS: 2 REF: 081130ge STA: G.G.18 TOP: Constructions

31 ANS:

$$V = \frac{4}{3} \pi \cdot 9^3 = 972\pi$$

PTS: 2 REF: 081131ge STA: G.G.16 TOP: Surface Area

32 ANS:

$$(x - 5)^2 + (y + 4)^2 = 36$$

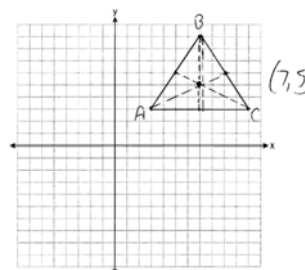
PTS: 2 REF: 081132ge STA: G.G.72 TOP: Equations of Circles

33 ANS:

$\angle ACB \cong \angle AED$ is given. $\angle A \cong \angle A$ because of the reflexive property. Therefore $\triangle ABC \sim \triangle ADE$ because of AA.

PTS: 2 REF: 081133ge STA: G.G.44 TOP: Similarity Proofs

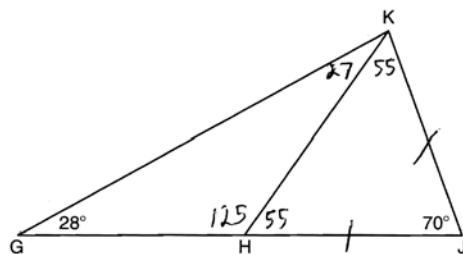
34 ANS:



$$(7,5) \quad m_{\overline{AB}} = \left(\frac{3+7}{2}, \frac{3+9}{2} \right) = (5,6) \quad m_{\overline{BC}} = \left(\frac{7+11}{2}, \frac{9+3}{2} \right) = (9,6)$$

PTS: 2 REF: 081134ge STA: G.G.21
 TOP: Centroid, Orthocenter, Incenter and Circumcenter

35 ANS:

No, $\angle KGH$ is not congruent to $\angle GKH$.

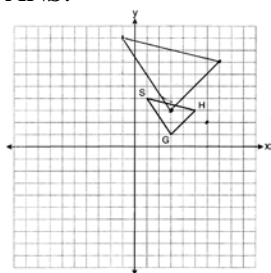
PTS: 2

REF: 081135ge

STA: G.G.31

TOP: Isosceles Triangle Theorem

36 ANS:

 $G''(3,3), H''(7,7), S''(-1,9)$

PTS: 4

REF: 081136ge

STA: G.G.58

TOP: Compositions of Transformations

37 ANS:

$$2 \quad \frac{x+2}{x} = \frac{x+6}{4}$$

$$x^2 + 6x = 4x + 8$$

$$x^2 + 2x - 8 = 0$$

$$(x+4)(x-2) = 0$$

$$x = 2$$

PTS: 2

REF: 081137ge

STA: G.G.45

TOP: Similarity

KEY: basic

38 ANS:

$m_{\overline{AB}} = \left(\frac{-6+2}{2}, \frac{-2+8}{2} \right) = D(2,3)$ $m_{\overline{BC}} = \left(\frac{2+6}{2}, \frac{8+-2}{2} \right) = E(4,3)$ $F(0,-2)$. To prove that $ADEF$ is a parallelogram, show that both pairs of opposite sides of the parallelogram are parallel by showing the opposite sides have the same slope: $m_{\overline{AD}} = \frac{3--2}{-2--6} = \frac{5}{4}$ $\overline{AF} \parallel \overline{DE}$ because all horizontal lines have the same slope. $ADEF$

$$m_{\overline{FE}} = \frac{3--2}{4-0} = \frac{5}{4}$$

is not a rhombus because not all sides are congruent. $AD = \sqrt{5^2 + 4^2} = \sqrt{41}$ $AF = 6$

PTS: 6

REF: 081138ge

STA: G.G.69

TOP: Quadrilaterals in the Coordinate Plane

0112ge Answer Section

1 ANS: 2

$$6x + 42 = 18x - 12$$

$$54 = 12x$$

$$x = \frac{54}{12} = 4.5$$

PTS: 2 REF: 011201ge STA: G.G.35 TOP: Parallel Lines and Transversals

2 ANS: 3 PTS: 2 REF: 011202ge STA: G.G.21

TOP: Centroid, Orthocenter, Incenter and Circumcenter

3 ANS: 2 PTS: 2 REF: 011203ge STA: G.G.73

TOP: Equations of Circles

4 ANS: 2

The diagonals of a rhombus are perpendicular. $180 - (90 + 12) = 78$

PTS: 2 REF: 011204ge STA: G.G.39 TOP: Special Parallelograms

5 ANS: 1

$$d = \sqrt{(4-1)^2 + (7-11)^2} = \sqrt{9+16} = \sqrt{25} = 5$$

PTS: 2 REF: 011205ge STA: G.G.67 TOP: Distance

KEY: general

6 ANS: 2 PTS: 2 REF: 011206ge STA: G.G.32

TOP: Exterior Angle Theorem

7 ANS: 1 PTS: 2 REF: 011207ge STA: G.G.20

TOP: Constructions

8 ANS: 4 PTS: 2 REF: 011208ge STA: G.G.53

TOP: Segments Intercepted by Circle KEY: two tangents

9 ANS: 3 PTS: 2 REF: 011209ge STA: G.G.44

TOP: Similarity Proofs

10 ANS: 3

$$\frac{3}{8+3+4} \times 180 = 36$$

PTS: 2 REF: 011210ge STA: G.G.30 TOP: Interior and Exterior Angles of Triangles

11 ANS: 2 PTS: 2 REF: 011211ge STA: G.G.55

TOP: Properties of Transformations

12 ANS: 4 PTS: 2 REF: 011212ge STA: G.G.71

TOP: Equations of Circles

13 ANS: 1 PTS: 2 REF: 011213ge STA: G.G.24

TOP: Negations

14 ANS: 2

$$\frac{50+x}{2} = 34$$

$$50+x = 68$$

$$x = 18$$

PTS: 2 REF: 011214ge STA: G.G.51 TOP: Arcs Determined by Angles

KEY: inside circle

15 ANS: 2 PTS: 2 REF: 011215ge STA: G.G.12

TOP: Volume

16 ANS: 4 PTS: 2 REF: 011216ge STA: G.G.29

TOP: Triangle Congruency

17 ANS: 3 PTS: 2 REF: 011217ge STA: G.G.64

TOP: Parallel and Perpendicular Lines

18 ANS: 1 PTS: 2 REF: 011218ge STA: G.G.3

TOP: Planes

19 ANS: 4

$$\sqrt{25^2 - \left(\frac{26-12}{2}\right)^2} = 24$$

PTS: 2 REF: 011219ge STA: G.G.40 TOP: Trapezoids

20 ANS: 1 PTS: 2 REF: 011220ge STA: G.G.72

TOP: Equations of Circles

21 ANS: 1 PTS: 2 REF: 011221ge STA: G.G.10

TOP: Solids

22 ANS: 4 PTS: 2 REF: 011222ge STA: G.G.34

TOP: Angle Side Relationship

23 ANS: 3

$$(n-2)180 = (5-2)180 = 540$$

PTS: 2 REF: 011223ge STA: G.G.36 TOP: Interior and Exterior Angles of Polygons

24 ANS: 3

$$y = mx + b$$

$$-1 = 2(2) + b$$

$$-5 = b$$

PTS: 2 REF: 011224ge STA: G.G.65 TOP: Parallel and Perpendicular Lines

25 ANS: 4

\overline{AB} is a vertical line, so its perpendicular bisector is a horizontal line through the midpoint of \overline{AB} , which is (0,3).

PTS: 2 REF: 011225ge STA: G.G.68 TOP: Perpendicular Bisector

26 ANS: 1

$$7x + 4 = 2(2x + 5). \quad PM = 2(2) + 5 = 9$$

$$7x + 4 = 4x + 10$$

$$3x = 6$$

$$x = 2$$

PTS: 2

REF: 011226ge

STA: G.G.43

TOP: Centroid

27 ANS: 4

$$x \cdot 4x = 6^2. \quad PQ = 4x + x = 5x = 5(3) = 15$$

$$4x^2 = 36$$

$$x = 3$$

PTS: 2

REF: 011227ge

STA: G.G.47

TOP: Similarity

KEY: leg

28 ANS: 2

$$5 - 3 = 2, 5 + 3 = 8$$

PTS: 2

REF: 011228ge

STA: G.G.33

TOP: Triangle Inequality Theorem

29 ANS:

$$2x - 20 = x + 20. \quad m\widehat{AB} = x + 20 = 40 + 20 = 60$$

$$x = 40$$

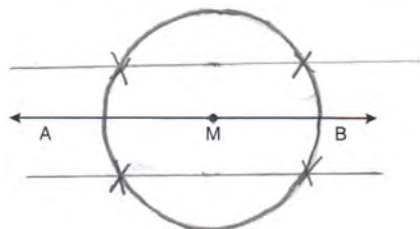
PTS: 2

REF: 011229ge

STA: G.G.52

TOP: Chords

30 ANS:



PTS: 2

REF: 011230ge

STA: G.G.22

TOP: Locus

31 ANS:

The slope of $y = 2x + 3$ is 2. The slope of $2y + x = 6$ is $\frac{-A}{B} = \frac{-1}{2}$. Since the slopes are opposite reciprocals, the lines are perpendicular.

PTS: 2

REF: 011231ge

STA: G.G.63

TOP: Parallel and Perpendicular Lines

32 ANS:

$$R'(-3, -2), S'(-4, 4), \text{ and } T'(2, 2).$$

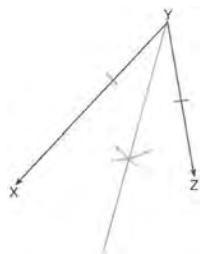
PTS: 2

REF: 011232ge

STA: G.G.54

TOP: Rotations

33 ANS:



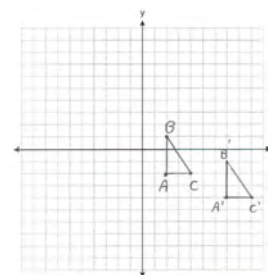
PTS: 2 REF: 011233ge STA: G.G.17 TOP: Constructions

34 ANS:

$$EO = 6. CE = \sqrt{10^2 - 6^2} = 8$$

PTS: 2 REF: 011234ge STA: G.G.49 TOP: Chords

35 ANS:



$A'(7, -4), B'(7, -1), C'(9, -4)$. The areas are equal because translations preserve distance.

PTS: 4 REF: 011235ge STA: G.G.55 TOP: Properties of Transformations

36 ANS:

$$V = \pi r^2 h \quad L = 2\pi rh = 2\pi \cdot 5\sqrt{2} \cdot 12 \approx 533.1$$

$$600\pi = \pi r^2 \cdot 12$$

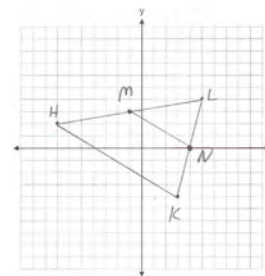
$$50 = r^2$$

$$\sqrt{25}\sqrt{2} = r$$

$$5\sqrt{2} = r$$

PTS: 4 REF: 011236ge STA: G.G.14 TOP: Volume

37 ANS:



$$M\left(\frac{-7+3}{2}, \frac{3+5}{2}\right) = M(-1, 3). \quad N\left(\frac{3+5}{2}, \frac{-4+4}{2}\right) = N(4, 0). \quad \overline{MN} \text{ is a midsegment.}$$

PTS: 4 REF: 011237ge STA: G.G.42 TOP: Midsegments

38 ANS:

Quadrilateral $ABCD$, $\overline{AD} \cong \overline{BC}$ and $\angle DAE \cong \angle BCE$ are given. $\overline{AD} \parallel \overline{BC}$ because if two lines are cut by a transversal so that a pair of alternate interior angles are congruent, the lines are parallel. $ABCD$ is a parallelogram because if one pair of opposite sides of a quadrilateral are both congruent and parallel, the quadrilateral is a parallelogram. $\overline{AE} \cong \overline{CE}$ because the diagonals of a parallelogram bisect each other. $\angle FEA \cong \angle GEC$ as vertical angles. $\triangle AEF \cong \triangle CEG$ by ASA.

PTS: 6

REF: 011238ge

STA: G.G.27

TOP: Quadrilateral Proofs