1. 060401a, P.I. A.S.9

   The test scores for 10 students in Ms. Sampson's homeroom were 61, 67, 81, 83, 87, 88, 89, 90, 98, and 100.  Which frequency table is accurate for this set of data?

   [A]

   | Interval | Frequency |
   | --- | --- |
   | 61–70 | 2 |
   | 71–80 | 0 |
   | 81–90 | 8 |
   | 91–100 | 10 |

   [B]

   | Interval | Frequency |
   | --- | --- |
   | 61–70 | 2 |
   | 71–80 | 2 |
   | 81–90 | 7 |
   | 91–100 | 10 |

   [C]

   | Interval | Frequency |
   | --- | --- |
   | 61–70 | 2 |
   | 71–80 | 2 |
   | 81–90 | 8 |
   | 91–100 | 10 |

   [D]

   | Interval | Frequency |
   | --- | --- |
   | 61–70 | 2 |
   | 71–80 | 0 |
   | 81–90 | 6 |
   | 91–100 | 2 |

2. 060402a, P.I. G.G.61

   What is the image of $(x, y)$ after a translation of 3 units right and 7 units down?

   [A] $(x - 3, y + 7)$         [B] $(x + 3, y - 7)$

   [C] $(x + 3, y + 7)$         [D] $(x - 3, y - 7)$

3. 060403a, P.I. A.N.7

   How many different outfits consisting of a hat, a pair of slacks, and a sweater can be made from two hats, three pairs of slacks, and four sweaters?

   [A] 29      [B] 9       [C] 24      [D] 12

4. 060404a, P.I. A.A.22

   If $3(x - 2) = 2x + 6$, the value of $x$ is

   [A] 0        [B] 20       [C] 5        [D] 12

5. 060405a, P.I. G.G.26

   Which statement is logically equivalent to "If a triangle is an isosceles triangle, then it has two congruent sides"?

   [A] If a triangle is not an isosceles triangle, then it has two congruent sides.

   [B] If a triangle does not have two congruent sides, then it is an isosceles triangle.

   [C] If a triangle does not have two congruent sides, then it is not an isosceles triangle.

   [D] If a triangle is an isosceles triangle, then it does not have two congruent sides.

6. 060406a, P.I. A.A.6

   Parking charges at Superior Parking Garage are $5.00 for the first hour and $1.50 for each additional 30 minutes.  If Margo has $12.50, what is the maximum amount of time she will be able to park her car at the garage?

   [A] $2\frac{1}{2}$ hours            [B] $6\frac{1}{2}$ hours

   [C] 6 hours                [D] $3\frac{1}{2}$ hours

7. 060407a, P.I. A.M.2

   If the temperature in Buffalo is 23° Fahrenheit, what is the temperature in degrees Celsius?  [Use the formula $C = \frac{5}{9}(F - 32)$.]

   [A] 5        [B] -45      [C] 45      [D] -5

8. 060408a, P.I. A.A.1

   Tara buys two items that cost $d$ dollars each. She gives the cashier $20.  Which expression represents the change she should receive?

   [A] $20 - 2d$                   [B] $20 + 2d$

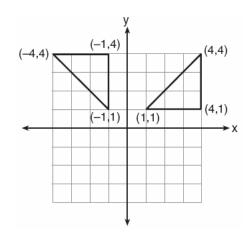   [C] $2d - 20$                   [D] $20 - d$

9.   060409a, P.I. A.A.6

At the beginning of her mathematics class, Mrs. Reno gives a warm-up problem. She says, "I am thinking of a number such that 6 less than the product of 7 and this number is 85." Which number is she thinking of?

[A] $11\frac{2}{7}$    [B] 13    [C] 637    [D] 84

10.   060410a, P.I. G.G.56

Which type of transformation is illustrated in the accompanying diagram?



[A] translation          [B] rotation

[C] dilation             [D] reflection

11.   060411a, P.I. G.G.45

Delroy's sailboat has two sails that are similar triangles. The larger sail has sides of 10 feet, 24 feet, and 26 feet. If the shortest side of the smaller sail measures 6 feet, what is the perimeter of the *smaller* sail?

[A] 100 ft               [B] 36 ft

[C] 15 ft                [D] 60 ft

12.   060412a

What is the least common denominator of $\frac{1}{2}$, $\frac{2}{7x}$, and $\frac{5}{x}$?

[A] $14x^2$    [B] $2x$    [C] $9x$    [D] $14x$

13.   060413a, P.I. A.N.1

Which property of real numbers is illustrated by the equation $-\sqrt{3}+\sqrt{3}=0$

[A] additive inverse

[B] commutative property of addition

[C] additive identity

[D] associative property of addition

14.   060414a, P.I. 8.G.3

The ratio of two supplementary angles is 2:7. What is the measure of the *smaller* angle?

[A] 10°    [B] 14°    [C] 20°    [D] 40°

15.   060415a, P.I. A.S.20

Mary chooses an integer at random from 1 to 6. What is the probability that the integer she chooses is a prime number?

[A] $\frac{3}{6}$    [B] $\frac{2}{6}$    [C] $\frac{4}{6}$    [D] $\frac{5}{6}$

16.   060416a, P.I. G.G.25

The statement "$x$ is *not* the square of an integer and $x$ is a multiple of 3" is true when $x$ is equal to

[A] 9    [B] 32    [C] 36    [D] 18

17.   060417a

Which phrase does *not* describe a triangle?

[A] obtuse right          [B] isosceles right

[C] acute scalene

[D] equilateral equiangular

18.   060418a, P.I. A.A.6

The number of people on the school board is represented by $x$. Two subcommittees with an equal number of members are formed, one with $\frac{2}{3}x-5$ members and the other with $\frac{x}{4}$ members. How many people are on the school board?

[A] 12    [B] 20    [C] 8    [D] 4

19. 060419a, P.I. A.A.44

The angle of elevation from a point 25 feet from the base of a tree on level ground to the top of the tree is 30°. Which equation can be used to find the height of the tree?

[A] $30^2 + 25^2 = x^2$     [B] $\sin 30° = \dfrac{x}{25}$

[C] $\cos 30° = \dfrac{x}{25}$     [D] $\tan 30° = \dfrac{x}{25}$

20. 060420a, P.I. A.N.5

Rashawn bought a CD that cost $18.99 and paid $20.51, including sales tax. What was the rate of the sales tax?

[A] 2%     [B] 8%     [C] 5%     [D] 3%

21. 060421a, P.I. A.A.20

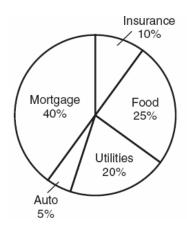If $3x$ is one factor of $3x^2 - 9x$, what is the other factor?

[A] $x + 3$          [B] $x^2 - 6x$

[C] $x - 3$          [D] $3x$

22. 060422a, P.I. 7.S.6

The accompanying circle graph shows how the Marino family spends its income each month.



What is the measure, in degrees, of the central angle that represents the percentage of income spent on food?

[A] 25     [B] 360     [C] 90     [D] 50

23. 060423a, P.I. G.G.37

Melissa is walking around the outside of a building that is in the shape of a regular polygon. She determines that the measure of one exterior angle of the building is 60°. How many sides does the building have?

[A] 9          [B] 12          [C] 6          [D] 3

24. 060424a, P.I. A.N.1

Which expression is an example of the associative property?

[A] $x + y + z = z + y + x$

[B] $x(y + z) = xy + xz$          [C] $x \cdot 1 = x$

[D] $(x + y) + z = x + (y + z)$

25. 060425a, P.I. A.A.5

A farmer has a rectangular field that measures 100 feet by 150 feet. He plans to increase the area of the field by 20%. He will do this by increasing the length and width by the same amount, $x$. Which equation represents the area of the new field?

[A] $2(100 + x) + 2(150 + x) = 15,000$

[B] $(100 + x)(150 + x) = 15,000$

[C] $(100 + x)(150 + x) = 18,000$

[D] $(100 + 2x)(150 + x) = 18,000$

26. 060426a, P.I. A2.S.11

In a game, each player receives 5 cards from a deck of 52 different cards. How many different groupings of cards are possible in this game?

[A] $_{52}P_5$     [B] $5!$     [C] $_{52}C_5$     [D] $\dfrac{52!}{5!}$

27. 060427a

A box in the shape of a cube has a volume of 64 cubic inches. What is the length of a side of the box?

[A] $21.\overline{3}$ in          [B] 8 in

[C] 16 in          [D] 4 in

28.  060428a, P.I. A.A.37
The line $3x - 2y = 12$ has

[A] a slope of 3 and a $y$-intercept of -2

[B] a slope of $-\dfrac{3}{2}$ and a $y$-intercept of 6

[C] a slope of $\dfrac{3}{2}$ and a $y$-intercept of -6

[D] a slope of -3 and a $y$-intercept of -6

29.  060429a, P.I. A.N.4
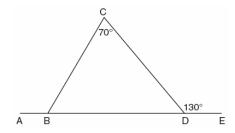If the mass of a proton is $1.67 \times 10^{-24}$ gram, what is the mass of 1,000 protons?

[A] $1.67 \times 10^{-21}$          [B] $1.67 \times 10^{-22}$

[C] $1.67 \times 10^{-27}$          [D] $1.67 \times 10^{-23}$

30.  060430a, P.I. A.A.28
If ($x$ - 4) is a factor of $x^2 - x - w = 0$, then the value of $w$ is

[A] 3          [B] 12          [C] -12          [D] -3

31.  060431a, P.I. G.G.32
In the accompanying diagram of $\Delta BCD$, $m\angle C = 70$, $m\angle CDE = 130$, and side $\overline{BD}$ is extended to $A$ and to $E$. Find $m\angle CBA$.
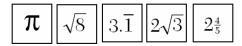


32.  060432a, P.I. A.CM.5
Brett was given the problem: "Evaluate $2x^2 + 5$ when $x = 3$." Brett wrote that the answer was 41. Was Brett correct? Explain your answer.
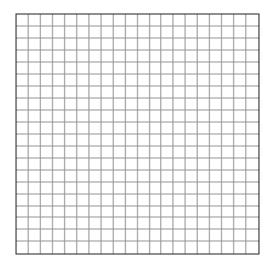
33.  060433a, P.I. 7.N.3
Kyoko's mathematics teacher gave her the accompanying cards and asked her to arrange the cards in order from least to greatest. In what order should Kyoko arrange the cards?



34.  060434a
The coordinates of the midpoint of $\overline{AB}$ are (2,4), and the coordinates of point $B$ are (3,7). What are the coordinates of point $A$? [The use of the accompanying grid is optional.]



35.  060435a, P.I. G.G.18
Using only a compass and a straightedge, construct the perpendicular bisector of $\overline{AB}$ and label it $c$. [Leave all construction marks.]
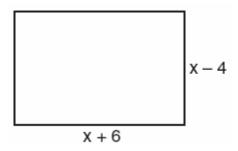
36.  060436a, P.I. A.RP.11

The senior class at South High School consists of 250 students. Of these students, 130 have brown hair, 160 have brown eyes, and 90 have both brown hair and brown eyes. How many members of the senior class have *neither* brown hair *nor* brown eyes?

37.  060437a, P.I. A.G.1

Express both the perimeter and the area of the rectangle shown in the accompanying diagram as polynomials in simplest form.

$X - 4$

$X + 6$

38.  060438a, P.I. A.A.6

On the first six tests in her social studies course, Jerelyn's scores were 92, 78, 86, 92, 95, and 91. Determine the median and the mode of her scores. If Jerelyn took a seventh test and raised the mean of her scores exactly 1 point, what was her score on the seventh test?
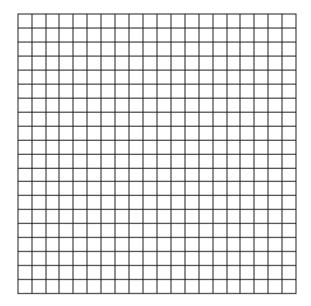
39.  060439a

Solve the following system of equations algebraically or graphically:

$$x^2 + y^2 = 25$$
$$3y - 4x = 0$$

[The use of the accompanying grid is optional.]

[1]  D

[2]  B

[3]  C

[4]  D

[5]  C

[6]  D

[7]  D

[8]  A

[9]  B

[10]  B

[11]  B

[12]  D

[13]  A

[14]  D

[15]  A

[16]  D

[17]  A

[18]  A

[19]  D

[20]  B

[21]  C

[22]  C

[23]  C

[24]  D

[25]  C

[26]  C

[27]  D

[28]  C

[29]  A

[30]  B

[2] 120, and appropriate work is shown, such as $m\angle CDB = 180 - 130 = 150$ and $m\angle CBA = 70 + 50 = 120$ or correctly labeled angles in a diagram.
[1] Appropriate work is shown, but one computational error is made.
or [1] Appropriate work is shown, but one conceptual error is made.
or [1] $m\angle CBD = 60$ is found, but no further correct work is shown.
or [1] 120, but no work is shown.
[0] A zero response is completely incorrect, irrelevant, or incoherent or is a correct response that was obtained by an obviously
[31]  incorrect procedure.

[2] No, and an appropriate explanation is given or the expression is evaluated correctly.
[1] No, and the correct order of operations is used to evaluate 2(3)2 + 5, but one computational error is made.
or [1] One conceptual error is made in evaluating the expression, but the question is answered appropriately.
or [1] Appropriate work is shown, but the question is not answered.
[0] No, but no explanation or an inappropriate explanation is given.
or [0] A zero response is completely incorrect, irrelevant, or incoherent or is a correct response that was obtained by an
[32]  obviously incorrect procedure.

[2] $2\frac{4}{5}$, $\sqrt{8}$, $3.\overline{1}$, $\pi$, $2\sqrt{3}$ and appropriate

work is shown, such as converting each value to a decimal equivalent.
[1] All values are correctly converted to decimal equivalents, but the order is not indicated or is indicated incorrectly.
or [1] One or two computational errors are made in finding decimal equivalents, but the appropriate order is indicated.
or [1] Appropriate work is shown, but one conceptual error is made, such as indicating the order from greatest to least.
or [1] $2\frac{4}{5}$, $\sqrt{8}$, $3.\overline{1}$, $\pi$, $2\sqrt{3}$, but no work is shown.
[0] A zero response is completely incorrect, irrelevant, or incoherent or is a correct response that was obtained by an obviously
[33]  incorrect procedure.

[2] (1,1), and appropriate work is shown, such as a correct graph of $\overline{AB}$ and an appropriate explanation of how point A is found or the use of the midpoint formula.
[1] Appropriate work is shown, but one computational or graphing error is made.
or [1] Appropriate work is shown, but one conceptual error is made, such as finding the midpoint of the given coordinates.
or [1] The midpoint and points A and B are graphed correctly, but the coordinates of point A are not stated or are stated incorrectly.
or [1] (1,1), but no work is shown.
[0] A zero response is completely incorrect, irrelevant, or incoherent or is a correct response that was obtained by an obviously
[34]  incorrect procedure.

[2] A correct construction is drawn, showing the arcs intersecting above and below $\overline{AB}$, and line c is drawn.
[1] A correct construction is drawn, but line c is not labeled.
[0] A drawing that is not a construction is shown with arc marks sketched.
or [0] A zero response is completely incorrect, irrelevant, or incoherent or is a correct response that was obtained by an
[35]  obviously incorrect procedure.

[3] 50, and appropriate work is shown, such as a Venn diagram.
[2] Appropriate work is shown, but one computational error is made.
or [2] 200, and appropriate work is shown to find the number of students that have brown hair and/or brown eyes.
[1] Appropriate work is shown, but two or more computational errors are made.
or [1] Appropriate work is shown, but one conceptual error is made.
or [1] The numbers of students who have brown hair only (40) and brown eyes only (70) are found, but no further correct work is shown.
or [1] 50, but no work is shown.
[0] A zero response is completely incorrect, irrelevant, or incoherent or is a correct response that was obtained by an obviously
[36]  incorrect procedure.

[3] Perimeter = $4x + 4$ or $4(x + 1)$ and area = $x^2 + 2x - 24$, and appropriate work is shown.

[2] $4x + 4$ and $x^2 + 2x - 24$, and appropriate work is shown, but the answers are not labeled or are labeled incorrectly.

or [2] Appropriate work is shown, but one computational error is made.

or [2] Area = $x^2 + 2x - 24$, and appropriate work is shown, but the perimeter is not found or is found incorrectly.

or [2] The area and perimeter are represented correctly, but only one of them is expressed in simplest form.

[1] Appropriate work is shown, but two or more computational errors are made.

or [1] Perimeter = $4x + 4$, and appropriate work is shown, but the area is not found or is found incorrectly.

or [1] The area and perimeter are represented correctly, but neither is expressed in simplest form.

or [1] Perimeter = $4x + 4$ or $4(x + 1)$ and area = $x^2 + 2x - 24$, but no work is shown.

[0] Perimeter = $4x + 4$ or area = $x^2 + 2x - 24$, but no work is shown.

or [0] $4x + 4$ and $x^2 + 2x - 24$, but no work is shown and the answers are not labeled or are labeled incorrectly.

or [0] A zero response is completely incorrect, irrelevant, or incoherent or is a correct response that was obtained by an

[37] obviously incorrect procedure.

[4] Median = 91.5, mode = 92, and seventh test score = 96, and appropriate work is shown.

[3] Appropriate work is shown, but one computational error is made.

or [3] Seventh test score = 96, but only the median or the mode is found correctly, but appropriate work is shown.

or [3] 91.5, 92, and 96, and appropriate work is shown, but the median and mode are not labeled or are labeled incorrectly.

[2] Appropriate work is shown, but two or more computational errors are made.

or [2] Appropriate work is shown, but one conceptual error is made.

or [2] Both the median and the mode are found and labeled correctly, and appropriate work is shown, but the seventh test score is not found or is found incorrectly.

or [2] Seventh test score = 96, and appropriate work is shown, but the median and the mode are not found or are found incorrectly.

[1] Either the median or the mode is found and labeled correctly, and appropriate work is shown, but no further correct work is shown.

or [1] Median = 91.5, mode = 92, and seventh test score = 96, but no work is shown.

[0] Median = 91.5 or mode = 92 or seventh test score = 96, but no work is shown.

or [0] 91.5, 92, and 96, but no work is shown and the answers are not labeled.

or [0] A zero response is completely incorrect, irrelevant, or incoherent or is a correct response that was obtained by an

[38] obviously incorrect procedure.

[4] (3,4) and (–3,–4), and a correct algebraic or graphic solution is shown.

[3] Appropriate work is shown, but one computational or graphing error is made.

or [3] Appropriate work is shown for an algebraic or graphic solution, but only one correct ordered pair is found or the correct values are found only for *x* or for *y*.

[2] Appropriate work is shown, but two or more computational or graphing errors are made.

or [2] Both equations are graphed correctly, but neither ordered pair is identified.

or [2] The line is graphed correctly, but the circle is graphed as a semicircle, and only one correct solution is identified.

or [2] An incorrect quadratic equation of equal difficulty is solved appropriately, and an appropriate solution or solutions are found.

or [2] The linear equation is graphed correctly and correct points of the circle are graphed, but the points are connected to form a quadrilateral, but appropriate ordered pairs are identified.

[1] Appropriate work is shown, but one conceptual error and one computational or graphing error are made.

or [1] One equation is graphed correctly, but no further correct work is shown.

or [1] An incorrect equation of a lesser degree of difficulty, such as a linear equation, is solved appropriately, and an appropriate solution or solutions are found.

or [1] A correct quadratic equation is set equal to zero, but no further correct work is shown.

or [1] (3,4) and (–3,–4), but no work is shown.

[0] (3,4) or (–3,–4), but no work is shown.

or [0] A zero response is completely incorrect, irrelevant, or incoherent or is a correct response that was obtained by an

[39]  obviously incorrect procedure.