

1. 080501a, P.I. A.S.4
The weights of all the students in grade 9 are arranged from least to greatest. Which statistical measure separates the top half of this set of data from the bottom half?

[A] average [B] mode
[C] mean [D] median

2. 080502a, P.I. A.N.7
Cole's Ice Cream Stand serves sixteen different flavors of ice cream, three types of syrup, and seven types of sprinkles. If an ice cream sundae consists of one flavor of ice cream, one type of syrup, and one type of sprinkles, how many different ice cream sundaes can Cole serve?

[A] 26 [B] 3 [C] 10,836 [D] 336

3. 080503a, P.I. A.N.6
The value of $\frac{7!}{3!}$ is

[A] 4 [B] 7 [C] 840 [D] 24

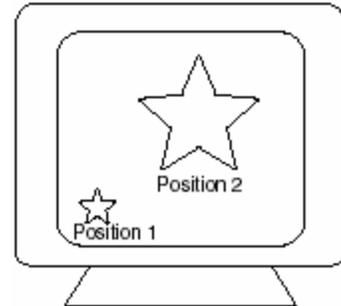
4. 080504a, P.I. A.N.1
The equation $*(\Delta + \diamond) = * \Delta + * \diamond$ is an example of the

[A] transitive law [B] distributive law
[C] associative law [D] commutative law

5. 080505a, P.I. G.G.25
The statement " x is divisible by 5 or x is divisible by 4" is *false* when x equals

[A] 10 [B] 16 [C] 27 [D] 20

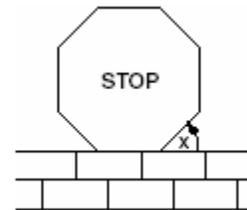
6. 080506a, P.I. G.G.60
As shown in the accompanying diagram, the star in position 1 on a computer screen transforms to the star in position 2.



This transformation is best described as a

[A] line reflection [B] dilation
[C] translation [D] rotation

7. 080507a, P.I. G.G.37
A stop sign in the shape of a regular octagon is resting on a brick wall, as shown in the accompanying diagram.



What is the measure of angle x ?

[A] 45° [B] 60° [C] 120° [D] 135°

8. 080508a, P.I. A.A.8
The height of a golf ball hit into the air is modeled by the equation $h = -16t^2 + 48t$, where h represents the height, in feet, and t represents the number of seconds that have passed since the ball was hit. What is the height of the ball after 2 seconds?

[A] 16 ft [B] 32 ft [C] 64 ft [D] 80 ft

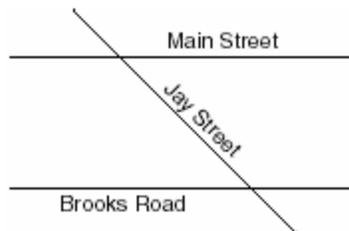
9. 080509a, P.I. A.A.1

The sum of Scott's age and Greg's age is 33 years. If Greg's age is represented by g , Scott's age is represented by

- [A] $33 - g$ [B] $g + 33$
[C] $g - 33$ [D] $33g$

10. 080510a, P.I. 8.A.12

The accompanying diagram shows two parallel streets, Main Street and Brooks Road, intersected by Jay Street. The obtuse angle that Jay Street forms with Brooks Road is three times the measure of the acute angle that Jay Street forms with Main Street.



What is the measure of the acute angle formed by Jay Street and Main Street?

- [A] 60° [B] 45° [C] 90° [D] 135°

11. 080511a, P.I. 7.N.5

The expression 0.62×10^3 is equivalent to

- [A] 0.062 [B] 62,000
[C] 6.2×10^4 [D] 6.2×10^2

12. 080512a, P.I. G.G.22

Which equation represents the locus of all points 5 units below the x -axis?

- [A] $x = -5$ [B] $x = 5$
[C] $y = -5$ [D] $y = 5$

13. 080513a, P.I. A.A.21

Which ordered pair is not in the solution set of $y > 2x + 1$?

- [A] (1,6) [B] (2,5) [C] (3,8) [D] (1,4)

14. 080514a, P.I. A.N.1

What is the identity element for \clubsuit in the accompanying table?

\clubsuit	r	s	t	u
r	t	r	u	s
s	r	s	t	u
t	u	t	s	r
u	s	u	r	t

- [A] s [B] t [C] r [D] u

15. 080515a

A line segment on the coordinate plane has endpoints (2,4) and (4,y). The midpoint of the segment is point (3,7). What is the value of y ?

- [A] 5 [B] 10 [C] 11 [D] -2

16. 080516a, P.I. 7.N.3

Which numbers are arranged from smallest to largest?

- [A] $3.14, \frac{22}{7}, \pi, \sqrt{9.1}$

- [B] $\sqrt{9.1}, 3.14, \pi, \frac{22}{7}$

- [C] $\sqrt{9.1}, 3.14, \frac{22}{7}, \pi$

- [D] $\sqrt{9.1}, \pi, 3.14, \frac{22}{7}$

17. 080517a, P.I. G.G.39

In a certain quadrilateral, two opposite sides are parallel, and the other two opposite sides are *not* congruent. This quadrilateral could be a

- [A] trapezoid [B] square
[C] parallelogram [D] rhombus

18. 080518a, P.I. A.A.6
A bicyclist leaves Bay Shore traveling at an average speed of 12 miles per hour. Three hours later, a car leaves Bay Shore, on the same route, traveling at an average speed of 30 miles per hour. How many hours after the car leaves Bay Shore will the car catch up to the cyclist?
[A] 4 [B] 5 [C] 2 [D] 8
19. 080519a
Which letter demonstrates line symmetry but *not* point symmetry?
[A] **S** [B] **T** [C] **H** [D] **N**
20. 080520a, P.I. G.G.33
Sara is building a triangular pen for her pet rabbit. If two of the sides measure 8 feet and 15 feet, the length of the third side could be
[A] 13 ft [B] 23 ft [C] 3 ft [D] 7 ft
21. 080521a, P.I. G.G.26
What is the converse of the statement "If Alicia goes to Albany, then Ben goes to Buffalo"?
[A] Alicia goes to Albany if and only if Ben goes to Buffalo.
[B] If Ben does not go to Buffalo, then Alicia does not go to Albany.
[C] If Ben goes to Buffalo, then Alicia goes to Albany.
[D] If Alicia does not go to Albany, then Ben does not go to Buffalo.
22. 080522a, P.I. A2.A.8
What is the value of 2^{-3} ?
[A] -8 [B] $\frac{1}{8}$ [C] $\frac{1}{6}$ [D] -6
23. 080523a, P.I. 7.N.2
Which is an irrational number?
[A] π [B] $\frac{3}{8}$ [C] $0.\bar{3}$ [D] $\sqrt{49}$
24. 080524a, P.I. A.N.3
What is the sum of $5\sqrt{7}$ and $3\sqrt{28}$?
[A] $9\sqrt{7}$ [B] $11\sqrt{7}$
[C] $60\sqrt{7}$ [D] $8\sqrt{35}$
25. 080525a, P.I. A.A.27
The solution set for the equation $x^2 - 5x = 6$ is
[A] $\{-1,6\}$ [B] $\{2,-3\}$
[C] $\{-2,3\}$ [D] $\{1,-6\}$
26. 080526a, P.I. A.A.12
The expression $\frac{5x^6y^2}{x^8y}$ is equivalent to
[A] $5x^2y$ [B] $5x^{14}y^3$
[C] $\frac{5y^3}{x^{14}}$ [D] $\frac{5y}{x^2}$
27. 080527a, P.I. A2.S.11
The expression ${}_9C_2$ is equivalent to
[A] $\frac{9!}{2!}$ [B] ${}_9P_7$ [C] ${}_9C_7$ [D] ${}_9P_2$
28. 080528a
The graph of the equation $x^2 + y^2 = 4$ can be described as a
[A] parabola with its vertex at (0,2)
[B] circle with its center at the origin and a radius of 2
[C] line passing through points (0,2) and (2,0)
[D] circle with its center at the origin and a radius of 4

29. 080529a, P.I. G.G.63
When solved graphically, which system of equations will have exactly one point of intersection?

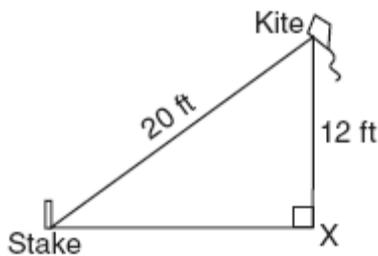
[A] $y = -x - 20$ [B] $y = 0.5x + 30$
 $y = x + 17$ $y = 0.5x - 30$

[C] $y = \frac{3}{5}x + 12$ [D] $y = -x + 15$
 $y = 0.6x - 19$ $y = -x + 25$

30. 080530a, P.I. A.A.23
If $\frac{x}{4} - \frac{a}{b} = 0$, $b \neq 0$, then x is equal to

[A] $\frac{4a}{b}$ [B] $-\frac{a}{4b}$ [C] $\frac{a}{4b}$ [D] $-\frac{4a}{b}$

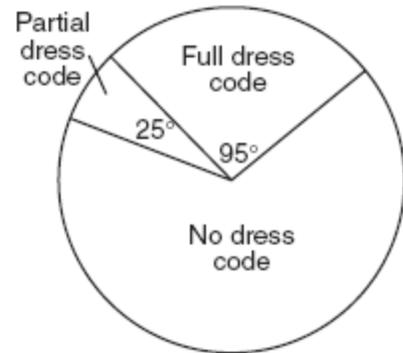
31. 080531a, P.I. A.A.45
The accompanying diagram shows a kite that has been secured to a stake in the ground with a 20-foot string. The kite is located 12 feet from the ground, directly over point X. What is the distance, in feet, between the stake and point X?



32. 080532a, P.I. A.RP.11
There are 30 students on a school bus. Of these students, 24 either play in the school band or sing in the chorus. Six of the students play in the school band but do not sing in the chorus. Fourteen of the students sing in the chorus and also play in the school band. How many students on the school bus sing in the chorus but do not play in the band?

33. 080533a, P.I. A2.A.7
Factor completely: $5n^2 - 80$

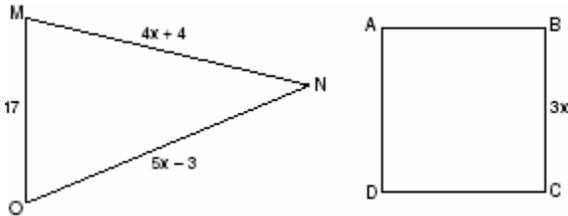
34. 080534a, P.I. 7.S.6
Nine hundred students were asked whether they thought their school should have a dress code. A circle graph was constructed to show the results. The central angles for two of the three sectors are shown in the accompanying diagram. What is the number of students who felt that the school should have no dress code?



35. 080535a, P.I. 6.S.5
Seth bought a used car that had been driven 20,000 miles. After he owned the car for 2 years, the total mileage of the car was 49,400. Find the average number of miles he drove *each month* during those 2 years.
36. 080536a, P.I. A.A.44
A tree casts a shadow that is 20 feet long. The angle of elevation from the end of the shadow to the top of the tree is 66° . Determine the height of the tree, to the *nearest foot*.

37. 080537a

In the accompanying diagram, the perimeter of $\triangle MNO$ is equal to the perimeter of square ABCD. If the sides of the triangle are represented by $4x + 4$, $5x - 3$, and 17, and one side of the square is represented by $3x$, find the length of a side of the square.



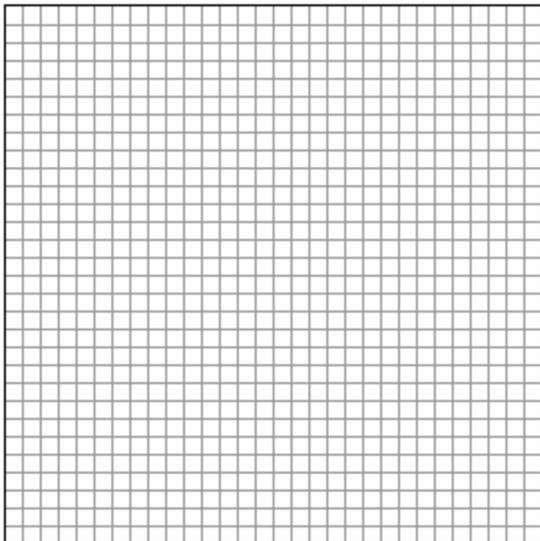
38. 080538a, P.I. A.A.11

Solve the following system of equations:

$$y = x^2 + 4x + 1$$

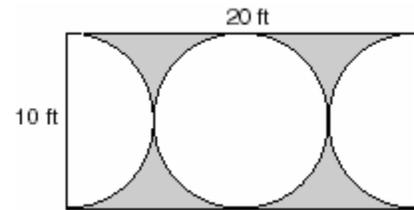
$$y = 5x + 3$$

[The use of the grid is optional.]



39. 080539a, P.I. A.G.1

Mr. Petri has a rectangular plot of land with length = 20 feet and width = 10 feet. He wants to design a flower garden in the shape of a circle with two semicircles at each end of the center circle, as shown in the accompanying diagram. He will fill in the shaded area with wood chips. If one bag of wood chips covers 5 square feet, how many bags must he buy?



- [1] D
- [2] D
- [3] C
- [4] B
- [5] C
- [6] B
- [7] A
- [8] B
- [9] A
- [10] B
- [11] D
- [12] C
- [13] B
- [14] A
- [15] B
- [16] B
- [17] A
- [18] C
- [19] B
- [20] A
- [21] C
- [22] B
- [23] A
- [24] B
- [25] A
- [26] D
- [27] C
- [28] B

- [29] A
- [30] A

[2] 16, and appropriate work is shown, such as the Pythagorean theorem, the Pythagorean triple, or trigonometry.

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

or [1] Appropriate work is shown, but one conceptual error is made, such as using an incorrect trigonometric function.

or [1] 16, 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] 4, and appropriate work is shown, such as a Venn 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] 4, 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

- [32] incorrect procedure.

[2] $5(n + 4)(n - 4)$, and appropriate work is shown.

[1] Appropriate work is shown, but one factoring error is made or the expression is not simplified completely.

[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] 600, and appropriate work is shown, such as $\frac{240}{360} \cdot 900 = 600$.

[1] Appropriate work is shown, but one computational error is made or the answer is expressed as a fraction.

or [1] Appropriate work is shown, but one conceptual error is made.

or [1] The central angle of 240° is found, but the number of students is not calculated.

or [1] An incorrect equation of equal difficulty is solved appropriately.

or [1] A correct equation is written, but no further correct work is shown.

or [1] 600, 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] 1,225, and appropriate work is shown, such as solving an equation or writing an explanation.

[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] Appropriate work is shown, but the conversion from years to months is incorrect, but an appropriate solution is found.

or [1] 1,225, 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

[35] incorrect procedure.

[3] 45, and appropriate work is shown, such as $\tan 66^\circ = \frac{x}{20}$.

[2] A correct trigonometric ratio is used, and values are substituted correctly, but one computational or rounding error is made, or the calculator is left in radian mode.

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

or [1] Appropriate work is shown, but one conceptual error is made, such as using an incorrect trigonometric ratio.

or [1] An incorrect diagram is drawn, but an appropriate solution is found.

or [1] A correctly labeled diagram is drawn, but no further correct work is shown.

or [1] A correct trigonometric ratio is written, but no further correct work is shown.

or [1] 45, 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] 18, and appropriate work is shown.

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

or [2] Appropriate work is shown, and the value of x is found, but no further correct work is shown.

[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] A correct expression is written for the perimeter of each figure, but no further correct work is shown.

or [1] 18, 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

[37] incorrect procedure.

[4] (-1,-2) and (2,13), and appropriate work is shown, such as an algebraic or graphic solution or trial and error with at least three trials and appropriate checks.

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

or [3] Appropriate work is shown, but only one solution is found or only the x- or the y-values are found.

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

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

or [2] The trial-and-error method is used to find the correct solutions, but only two trials and appropriate checks are shown.

or [2] The trial-and-error method is attempted and at least six systematic trials and appropriate checks are shown, but no solution is found.

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

or [2] Only one equation is graphed correctly, but an appropriate solution is found.

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

[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.

or [1] A correct substitution is made and the system of equations is simplified to a single quadratic equation set equal to zero, but no further correct work is shown.

or [1] (-1,-2) and (2,13), but no work or only one trial with an appropriate check is shown.

[0] (-1,-2) or (2,13), but no work or only one trial with an appropriate check is shown.

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] 9, and appropriate work is shown.

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

or [3] Appropriate work is shown, and the areas of the rectangle and one circle are found correctly, but the area of the circle is not doubled, but an appropriate number of bags is found.

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

or [2] Appropriate work is shown, but one conceptual error is made, such as using an incorrect formula for the area of a circle, but an appropriate number of bags is found.

or [2] The areas of the rectangle and the circle are found correctly, but no further correct work is shown.

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

or [1] 9, 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

[39] incorrect procedure.