

1. 010901a

Given the true statements:

"Rob plays basketball or tennis."

"Rob does not play tennis."

Which statement must also be true?

[A] Rob plays basketball.

[B] Rob does not play basketball, and he does not play tennis.

[C] Rob does not play basketball.

[D] Rob plays football.

2. 010902a, P.I. A.N.5

Granola bars cost \$0.55 each. Which table represents this relationship?

[A]

Number of Bars	Total Cost
0	\$0.00
2	1.10
4	2.20

[B]

Number of Bars	Total Cost
0	\$0.55
2	1.10
4	2.20

[C]

Number of Bars	Total Cost
0	\$0.55
2	0.55
4	0.55

[D]

Number of Bars	Total Cost
0	\$0.00
2	1.00
4	2.00

3. 010903a, P.I. A.A.1

A ship sailed t miles on Tuesday and w miles on Wednesday. Which expression represents the average distance per day traveled by the ship?

[A] $2(t + w)$

[B] $t - w$

[C] $t + \frac{w}{2}$

[D] $\frac{t + w}{2}$

4. 010904a, P.I. A.A.22

What is the value of x in the equation $2(x - 3) + 1 = 19$?

[A] 12

[B] 10.5

[C] 9

[D] 6

5. 010905a, P.I. A.A.34

Which equation represents the line whose slope is 2 and whose y -intercept is 6?

[A] $y + 2x = 6$

[B] $y = 2x + 6$

[C] $2y + 6x = 0$

[D] $y = 6x + 2$

6. 010906a, P.I. A.A.25

If $0.02x + 0.7 = 0.8$, then x is equal to

[A] 0.5

[B] 2

[C] 50

[D] 5

7. 010907a, P.I. A.S.20

If the probability of a spinner landing on red in a game is $\frac{1}{5}$, what is the probability of it *not* landing on red?

[A] 50%

[B] 25%

[C] 20%

[D] 80%

8. 010908a, P.I. A.A.22

What is the solution for the equation $x + 1 = x + 2$?

[A] $\frac{1}{2}$

[B] There is no solution.

[C] -1

[D] all real numbers

9. 010909a, P.I. A.A.6

If five times the measure of an angle is decreased by 30° , the result is the same as when two times the measure of the angle is increased by 18° . What is the measure of the angle?

[A] 4°

[B] 16°

[C] -4°

[D] -16°

10. 010910a, P.I. A.A.12

The expression $(-2a^2b^3)(4ab^5)(6a^3b^2)$ is equivalent to

[A] $8a^6b^{30}$

[B] $-48a^5b^{10}$

[C] $48a^5b^{10}$

[D] $-48a^6b^{10}$

11. 010911a

What is the value of n if the number 0.0000082 is written in the form 8.2×10^n ?

[A] -5

[B] 5

[C] 6

[D] -6

12. 010912a, P.I. A.N.3

The sum of $\sqrt{27}$ and $\sqrt{108}$ is

- [A] $3\sqrt{3}$ [B] $\sqrt{135}$
[C] $9\sqrt{3}$ [D] $4\sqrt{27}$

13. 010913a, P.I. A.A.28

Which equation has the solution set $\{1,3\}$?

- [A] $x^2 + 4x + 3 = 0$ [B] $x^2 - 4x + 3 = 0$
[C] $x^2 + 4x - 3 = 0$ [D] $x^2 - 4x - 3 = 0$

14. 010914a, P.I. G.G.66

The midpoint of \overline{AB} has coordinates of $(5,-1)$.
If the coordinates of A are $(2,-3)$, what are the
coordinates of B ?

- [A] $(8,-5)$ [B] $(7,0)$
[C] $(3.5,-2)$ [D] $(8,1)$

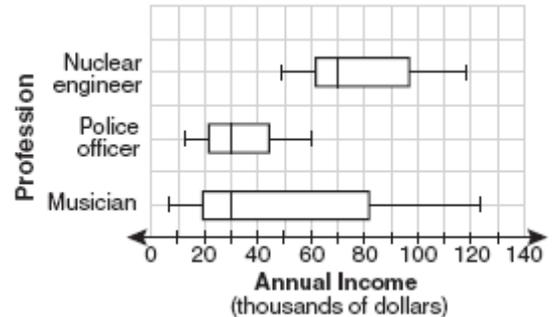
15. 060807a, P.I. A.N.6

If $x = 2$ and $y = -3$, what is the value of
 $2x^2 - 3xy - 2y^2$?

- [A] -20 [B] 16 [C] 8 [D] -2

16. 010916a, P.I. A.S.6

The accompanying box-and-whisker plots can
be used to compare the annual incomes of
three professions.



Based on the box-and-whisker plots, which
statement is true?

- [A] All nuclear engineers earn more than all
police officers.
[B] A musician will eventually earn more
than a police officer.
[C] The median income for nuclear engineers
is greater than the income of all
musicians.
[D] The median income for police officers
and musicians is the same.

17. 010971a, P.I. A.A.15

For which value of m is the expression

$$\frac{15m^2n}{3-m} \text{ undefined?}$$

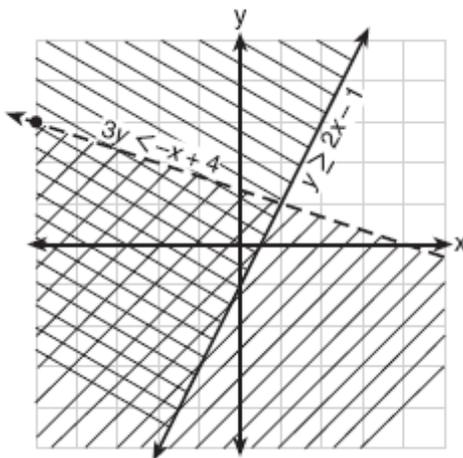
- [A] 0 [B] 3 [C] 1 [D] -3

18. 010918a, P.I. G.G.54

What is the image of point $(-3,7)$ after a
reflection in the x -axis?

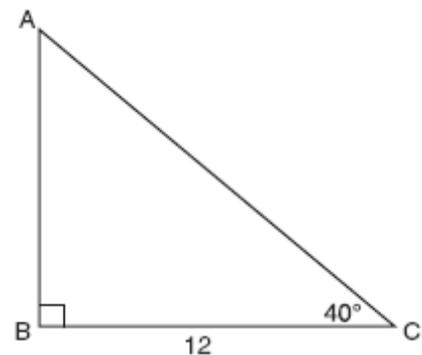
- [A] $(3,-7)$ [B] $(3,7)$
[C] $(-3,-7)$ [D] $(7,-3)$

19. 010919a, P.I. G.G.39
Which statement is *false*?
- [A] All parallelograms are quadrilaterals.
[B] All rectangles are parallelograms.
[C] All squares are rhombuses.
[D] All rectangles are squares.
20. 010920a, P.I. A2.A.3
The graphs of the equations $x^2 + y^2 = 4$ and $y = x$ are drawn on the same set of axes.
What is the total number of points of intersection?
- [A] 1 [B] 2 [C] 3 [D] 0
21. 010921a, P.I. A.A.17
Expressed as a single fraction, $\frac{3}{4x} - \frac{2}{5x}$ is equal to
- [A] $\frac{7}{20x}$ [B] $\frac{1}{9x}$ [C] $-\frac{1}{x}$ [D] $\frac{1}{20x}$
22. 010922a, P.I. A.A.40
Which point is a solution for the system of inequalities shown on the accompanying graph?



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

23. 010923a, P.I. G.G.26
Which statement is an example of a biconditional statement?
- [A] If Craig has money, he buys a car.
[B] Craig buys a car if and only if he has money.
[C] Craig has money or he buys a car.
[D] Craig has money and he buys a car.
24. 010924a, P.I. A.N.1
Which property of real numbers is illustrated by the equation $52 + (27 + 36) = (52 + 27) + 36$?
- [A] associative property
[B] commutative property
[C] identity property of addition
[D] distributive property
25. 010925a, P.I. A.N.8
How many different two-letter arrangements can be formed using the letters in the word "BROWN"?
- [A] 20 [B] 12 [C] 10 [D] 25
26. 010926a, P.I. A.A.44
In the accompanying diagram of right triangle ABC , $BC = 12$ and $m\angle C = 40$.



Which single function could be used to find AB ?

- [A] $\sin 50$ [B] $\cos 40$
[C] $\tan 50$ [D] $\sin 40$

27. 010927a, P.I. A2.A.23
When 5 is divided by a number, the result is 3 more than 7 divided by twice the number. What is the number?

[A] 5 [B] 2 [C] 1 [D] $\frac{1}{2}$

28. 010928a, P.I. A.N.1
Under which operation is the set of odd numbers closed?

[A] subtraction [B] division
[C] addition [D] multiplication

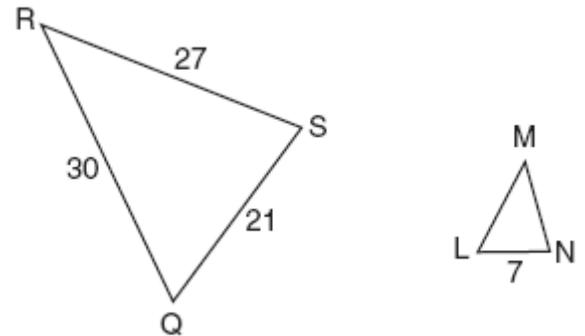
29. 010929a, P.I. A2.S.11
A basketball squad has ten players. Which expression represents the number of five-player teams that can be made if John, the team captain, must be on every team?

[A] $_{10}P_5$ [B] $_{10}C_5$ [C] $_9P_4$ [D] $_9C_4$

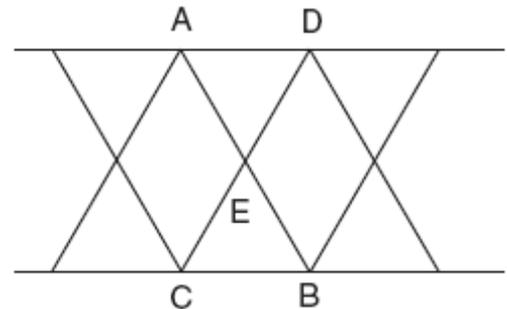
30. 010930a, P.I. G.G.26
Which statement is logically equivalent to “If I am in a mathematics class, then I am having fun”?

[A] If I am having fun, then I am in a mathematics class.
[B] If I am not in a mathematics class, then I am not having fun.
[C] If I am not having fun, then I am not in a mathematics class.
[D] If I am in a mathematics class, then I am not having fun.

31. 010931a, P.I. G.G.45
In the accompanying diagram, $\triangle QRS$ is similar to $\triangle LMN$, $RQ = 30$, $QS = 21$, $SR = 27$, and $LN = 7$. What is the length of \overline{ML} ?



32. 010932a
The support beams on a bridge intersect in the pattern shown in the accompanying diagram. If \overline{AB} and \overline{CD} intersect at point E , $m\angle AED = 3x + 30$, and $m\angle CEB = 7x - 10$, find the value of x .



33. 010933a, P.I. A.A.45
The “Little People” day care center has a rectangular, fenced play area behind its building. The play area is 30 meters long and 20 meters wide. Find, to the nearest meter, the length of a pathway that runs along the diagonal of the play area.

34. 010934a, P.I. A.A.13
Subtract $2x^2 - 5x + 8$ from $6x^2 + 3x - 2$ and express the answer as a trinomial.

35. 010935a, P.I. A.A.18

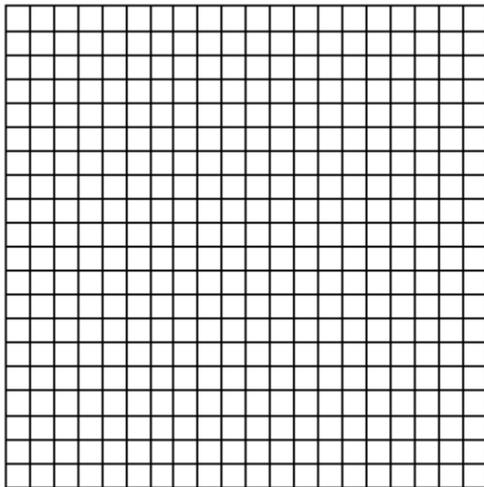
Express in simplest form: $\frac{8x}{x^2 - 16} \div \frac{2x}{x + 4}$

36. 010936a, P.I. A.A.6

Juan received scores of 82, 76, 93, and 80 on his first four chemistry tests of the year. His goal is to have an 86 average in chemistry for his first five tests. What score must he earn on the next test to achieve an average of exactly 86?

37. 010937a

On the accompanying grid, graph and label quadrilateral $ABCD$, whose coordinates are $A(-1,3)$, $B(2,0)$, $C(2,-1)$, and $D(-3,-1)$. Graph, label, and state the coordinates of $A'B'C'D'$, the image of $ABCD$ under a dilation of 2, where the center of dilation is the origin.



38. 010938a, P.I. A.A.6

Mr. Braun has \$75.00 to spend on pizzas and soda pop for a picnic. Pizzas cost \$9.00 each and the drinks cost \$0.75 each. Five times as many drinks as pizzas are needed. What is the maximum number of pizzas that Mr. Braun can buy?

39. 010939a, P.I. A.S.5

The daily high temperatures for the month of February in New York City were: 34° , 37° , 31° , 36° , 30° , 32° , 32° , 34° , 30° , 37° , 31° , 30° , 30° , 31° , 36° , 34° , 36° , 32° , 32° , 30° , 37° , 31° , 36° , 32° , 31° , 36° , 31° , and 35° . Complete the table below. Use the table to construct a frequency histogram for these temperatures on the accompanying grid.

Temperature, in Degrees	Tally	Frequency
30		
31		
32		
33		
34		
35		
36		
37		



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

- [29] D
- [30] C

[2] 10, and appropriate work is shown.
[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 writing an incorrect proportion.
or [1] A correct proportion is written, but no further correct work is shown.
or [1] 10, 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] 10, and appropriate work is shown.
[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 the equation $3x + 30 + 7x - 10 = 180$.
or [1] A correct equation is written, but no further correct work is shown.
or [1] 10, 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] 36, and appropriate work is shown.
[1] Appropriate work is shown, but one computational or rounding error is made.
or [1] Appropriate work is shown, but one conceptual error is made.
or [1] 36, 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] $4x^2 + 8x - 10$, and appropriate work is shown.

[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 not distributing the negative sign or subtracting in the wrong order.

or [1] $4x^2 + 8x - 10$, 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] $\frac{4}{x-4}$, and appropriate work is shown.

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

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

or [1] $\frac{4}{x-4}$, 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

[35] incorrect procedure.

[3] 99, and appropriate work is shown, such as solving the equation $\frac{x+331}{5} = 86$ or trial

and error with at least three trials and appropriate checks.

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

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

or [1] 99, but no work or only one trial with an appropriate check 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] Quadrilateral $ABCD$ and its image are graphed and labeled correctly, and the coordinates of $A'B'C'D'$ are stated as $(-2,6)$, $(4,0)$, $(4,-2)$, and $(-6,-2)$.

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

or [2] Quadrilateral $A'B'C'D'$ is graphed and labeled correctly, and its coordinates are stated correctly, but quadrilateral $ABCD$ is not graphed.

[2] Quadrilateral $ABCD$ is graphed incorrectly, but an appropriate image is graphed and labeled, and the appropriate coordinates of $A'B'C'D'$ are stated.

or [2] Both quadrilaterals are graphed correctly, and the coordinates of $A'B'C'D'$ are stated correctly, but one or both of the quadrilaterals are not labeled.

or [2] Both quadrilaterals are graphed and labeled correctly, but the coordinates of $A'B'C'D'$ are not stated or are stated incorrectly.

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

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

or [1] Both quadrilaterals are graphed correctly but neither is labeled, and the coordinates of $A'B'C'D'$ are not stated or are stated incorrectly.

[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] 5, and appropriate work is shown, such as an algebraic solution or trial and error with at least three trials and appropriate checks.

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

[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.

or [2] The trial-and-error method is used, 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] A correct inequality or equation is written, 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] 5, but no work or only one trial with an appropriate check is shown.

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

[38] incorrect procedure.

[4] The frequency table is completed correctly and a frequency histogram is drawn with both axes labeled correctly.

[3] The frequency table is completed correctly, but one graphing error is made, such as an incorrect scale or not labeling the axes correctly.

[3] An incorrect frequency table is shown, but an appropriate frequency histogram is drawn and labeled.

[2] The frequency table is completed correctly, but two or more graphing errors are made.

or [2] The frequency table is completed correctly, but one conceptual error is made, such as drawing an appropriate bar graph or a cumulative frequency histogram.

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

or [1] The frequency table is completed correctly, but no further correct 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.