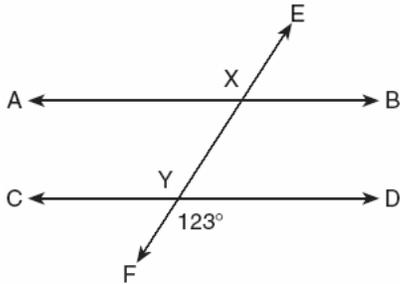


- 060101a, P.I. A.A.1
A car travels 110 miles in 2 hours. At the same rate of speed, how far will the car travel in h hours?
[A] $55h$ [B] $220h$ [C] $\frac{h}{220}$ [D] $\frac{h}{55}$
- 060102a, P.I. A.A.14
Which polynomial is the quotient of $\frac{6x^3 + 9x^2 + 3x}{3x}$?
[A] $2x + 3$ [B] $2x^2 + 3x$
[C] $6x^2 + 9x$ [D] $2x^2 + 3x + 1$
- 060103a
If the length of a rectangular prism is doubled, its width is tripled, and its height remains the same, what is the volume of the new rectangular prism?
[A] six times the original volume
[B] double the original volume
[C] nine times the original volume
[D] triple the original volume
- 060104a, P.I. A2.A.7
One root of the equation $2x^2 - x - 15 = 0$ is
[A] -3 [B] $\frac{5}{2}$ [C] 3 [D] $\frac{3}{2}$
- 060105a
Which properties best describe the coordinate graph of two distinct parallel lines?
[A] same slopes and different intercepts
[B] different slopes and different intercepts
[C] same slopes and same intercepts
[D] different slopes and same intercepts
- 060106a, P.I. G.G.38
Which statement is *not* always true about a parallelogram?
[A] The opposite sides are congruent.
[B] The opposite sides are parallel.
[C] The opposite angles are congruent.
[D] The diagonals are congruent.
- 060107a, P.I. G.G.30
In isosceles triangle DOG , the measure of the vertex angle is three times the measure of one of the base angles. Which statement about $\triangle DOG$ is true?
[A] $\triangle DOG$ is a scalene triangle.
[B] $\triangle DOG$ is an obtuse triangle.
[C] $\triangle DOG$ is a right triangle.
[D] $\triangle DOG$ is an acute triangle.
- 060108a, P.I. A.N.1
Which equation illustrates the distributive property for real numbers?
[A] $(1.3 \times 0.07) \times 0.63 = 1.3 \times (0.07 \times 0.63)$
[B] $\frac{1}{3} + \frac{1}{2} = \frac{1}{2} + \frac{1}{3}$
[C] $-3(5 + 7) = (-3)(5) + (-3)(7)$
[D] $\sqrt{3} + 0 = \sqrt{3}$
- 060109a, P.I. A2.A.7
Factor completely: $3x^2 - 27$
[A] $3(x - 3)^2$ [B] $(3x + 3)(x - 9)$
[C] $3(x^2 - 27)$ [D] $3(x + 3)(x - 3)$
- 060110a
At a school costume party, seven girls wore masks and nine boys did not. If there were 15 boys at the party and 20 students did not wear masks, what was the total number of students at the party?
[A] 35 [B] 30 [C] 33 [D] 42

11. 060111a, P.I. A.A.6
If one-half of a number is 8 less than two-thirds of the number, what is the number?
[A] 48 [B] 24 [C] 54 [D] 32
12. 060112a, P.I. G.G.26
Which statement is logically equivalent to "If I eat, then I live"?
[A] If I eat, then I do not live.
[B] If I do not live, then I do not eat.
[C] If I live, then I eat.
[D] I live if and only if I eat.
13. 060113a, P.I. 7.N.11
If a is an odd number, b an even number, and c an odd number, which expression will always be equivalent to an odd number?
[A] $ac(b)^2$ [B] $ac(b)^0$
[C] $ac(b)^1$ [D] $a(bc)$
14. 060114a, P.I. A2.S.11
If there are four teams in a league, how many games will have to be played so that each team plays every other team once?
[A] 16 [B] 8 [C] 3 [D] 6
15. 060115a, P.I. A.A.45
A woman has a ladder that is 13 feet long. If she sets the base of the ladder on level ground 5 feet from the side of a house, how many feet above the ground will the top of the ladder be when it rests against the house?
[A] 12 [B] 8 [C] 9 [D] 11
16. 060116a, P.I. A.N.5
A boy got 50% of the questions on a test correct. If he had 10 questions correct out of the first 12, and $\frac{1}{4}$ of the remaining questions correct, how many questions were on the test?
[A] 26 [B] 28 [C] 24 [D] 16
17. 060117a, P.I. A.A.7
A hotel charges \$20 for the use of its dining room and \$2.50 a plate for each dinner. An association gives a dinner and charges \$3 a plate but invites four nonpaying guests. If each person has one plate, how many paying persons must attend for the association to collect the exact amount needed to pay the hotel?
[A] 40 [B] 44 [C] 20 [D] 60
18. 060118a, P.I. A.A.21
In the set of positive integers, what is the solution set of the inequality $2x - 3 < 5$?
[A] {1, 2, 3} [B] {0, 1, 2, 3, 4}
[C] {0, 1, 2, 3} [D] {1, 2, 3, 4}
19. 060119a
What is the total number of points of intersection in the graphs of the equations $x^2 + y^2 = 16$ and $y = 4$?
[A] 1 [B] 3 [C] 0 [D] 2
20. 060120a, P.I. 7.N.2
Which is a rational number?
[A] π [B] $5\sqrt{9}$ [C] $\sqrt{8}$ [D] $6\sqrt{2}$
21. 060121a, P.I. A.RP.11
A school district offers hockey and basketball. The result of a survey of 300 students showed:
120 students play hockey, only
90 students play basketball, only
30 students do not participate in either sport
Of those surveyed, how many students play both hockey and basketball?

22. 060122a, P.I. 8.G.5
In the accompanying diagram, parallel lines \overline{AB} and \overline{CD} are intersected by transversal \overline{EF} at points X and Y , and $m\angle FYD = 123$. Find $m\angle AXY$.

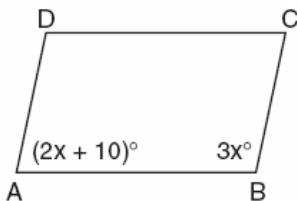


23. 060123a, P.I. A.A.7
Ben had twice as many nickels as dimes. Altogether, Ben had \$4.20. How many nickels *and* how many dimes did Ben have?

24. 060124a, P.I. A.A.26
If a girl 1.2 meters tall casts a shadow 2 meters long, how many meters tall is a tree that casts a shadow 75 meters long at the same time?

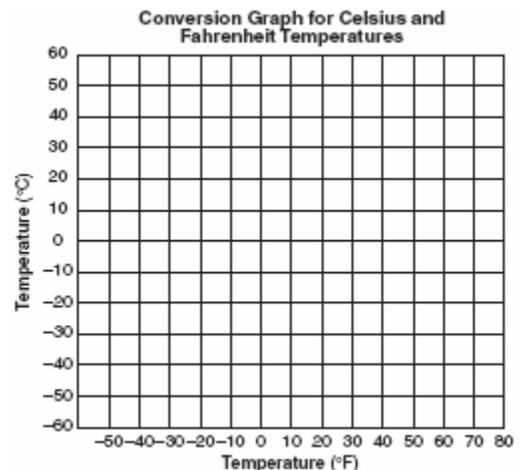
25. 060125a, P.I. A.N.8
There were seven students running in a race. How many different arrangements of first, second, and third place are possible?

26. 060126a, P.I. G.G.38
In the accompanying diagram of parallelogram $ABCD$, $m\angle A = (2x + 10)$ and $m\angle B = 3x$. Find the number of degrees in $m\angle B$.



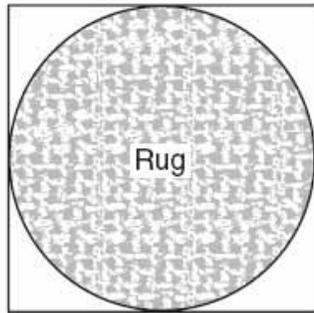
27. 060127a, P.I. A.N.5
A factory packs CD cases into cartons for a music company. Each carton is designed to hold 1,152 CD cases. The Quality Control Unit in the factory expects an error of less than 5% over or under the desired packing number. What is the *least* number and the *most* number of CD cases that could be packed in a carton and still be acceptable to the Quality Control Unit?

28. 060128a, P.I. A.M.2
Connor wants to compare Celsius and Fahrenheit temperatures by drawing a conversion graph. He knows that $-40^\circ C = -40^\circ F$ and that $20^\circ C = 68^\circ F$. On the accompanying grid, construct the conversion graph and, using the graph, determine the Celsius equivalent of $25^\circ F$.



29. 060129a, P.I. A.G.1

Virginia has a circular rug on her square living room floor, as represented in the accompanying diagram. If her entire living room floor measures 100 square feet, what is the area of the part of the floor covered by the rug?



30. 060130a, P.I. A.S.23

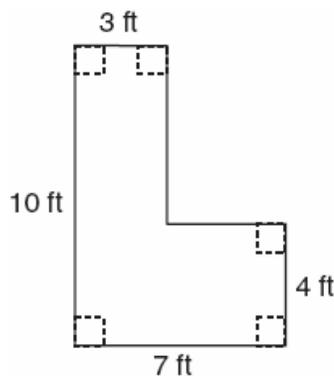
Mr. Yee has 10 boys and 15 girls in his mathematics class. If he chooses two students at random to work on the blackboard, what is the probability that both students chosen are girls?

31. 060131a, P.I. A.A.8

Find three consecutive odd integers such that the product of the first and the second exceeds the third by 8.

32. 060132a, P.I. A.G.1

Keesha wants to tile the floor shown in the accompanying diagram. If each tile measures 1 foot by 1 foot and costs \$2.99, what will be the total cost, including an 8% sales tax, for tiling the floor?

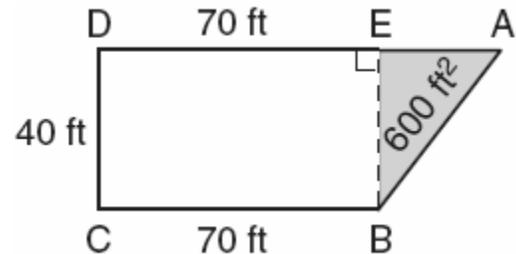


33. 060133a, P.I. A.A.7

Ramón rented a sprayer and a generator. On his first job, he used each piece of equipment for 6 hours at a total cost of \$90. On his second job, he used the sprayer for 4 hours and the generator for 8 hours at a total cost of \$100. What was the hourly cost of *each* piece of equipment?

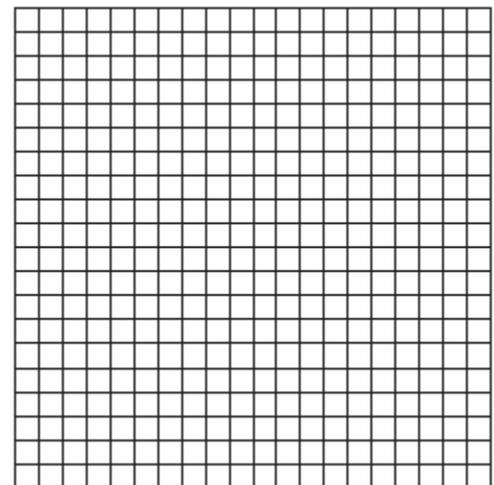
34. 060134a, P.I. A.G.1

The plan of a parcel of land is represented by trapezoid $ABCD$ in the accompanying diagram. If the area of $\triangle ABE$ is 600 square feet, find the minimum number of feet of fence needed to completely enclose the entire parcel of land, $ABCD$.



35. 060135a, P.I. G.G.54

Triangle SUN has coordinates $S(0,6)$, $U(3,5)$, and $N(3,0)$. On the accompanying grid, draw and label $\triangle SUN$. Then, graph and state the coordinates of $\triangle S'U'N'$, the image of $\triangle SUN$ after a reflection in the y -axis.



- [2] 42 nickels and 21 dimes, and appropriate work is shown, such as $0.1x + (0.05)2x = 4.20$ or a guess and a check with a minimum of two trials and appropriate checks or another appropriate method.
- [1] 42 nickels or 21 dimes, but appropriate work is shown.
- or [1] Appropriate work is shown, but no answer or an incorrect answer is found.
- or [1] 42 nickels and 21 dimes, 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 incorrect procedure.
-
- [23] [2] 45, and appropriate work is shown, such as a diagram or $\frac{1.2}{2} = \frac{x}{75}$.
- [1] Appropriate work is shown, but no answer or an incorrect answer is found.
- 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 incorrect procedure.
-
- [24] [2] 210, and appropriate work is shown, such as $7 \cdot 6 \cdot 5$ or ${}_7P_3$.
- [1] Appropriate work is shown, but no answer or an incorrect answer is found.
- or [1] 210, 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 incorrect procedure.
-
- [25] [3] 102, and appropriate work is shown, such as using the equation $2x + 10 + 3x = 180$ or an equivalent equation.
- [2] The equation $2x + 10 + 3x = 180$ is solved correctly for x , but $m\angle B$ is not determined or is determined incorrectly.
- [1] Appropriate work is shown, but one computational error is made or x is not determined.
- or [1] The equation $2x + 10 + 3x = 360$ is solved correctly, and an answer of 210 is found.
- or [1] 102, but no work is shown.
- [0] The equation $2x + 10 = 3x$ where $x = 10$ is given.
- or [0] A zero response is completely incorrect, irrelevant, or incoherent or is a correct response that was obtained by an obviously incorrect procedure.
-
- [26] [3] 1,095 and 1,209, and appropriate work is shown.
- [2] Appropriate work is shown, but one computational error is made.
- or [2] Appropriate work is shown, but a whole-number solution is not found.
- or [2] 5% of CD cases is rounded to 58, but 58 is added to or subtracted from 1,152 appropriately.
- or [2] Appropriate work is shown, but only one correct solution is found.
- [1] Appropriate work is shown, but more than one computational error is made.
- or [1] 5% of CD cases is rounded to 58, but 58 is added to or subtracted from 1,152, but one computational error is made.
- or [1] 5% of 1,152 is found, but no further work is shown.
- or [1] 1,095 and 1,209, 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 incorrect procedure.
-
- [27] [3] 1,095 and 1,209, and appropriate work is shown, such as using the equation $2x + 10 + 3x = 180$ or an equivalent equation.
- [2] The equation $2x + 10 + 3x = 180$ is solved correctly for x , but $m\angle B$ is not determined or is determined incorrectly.
- [1] Appropriate work is shown, but one computational error is made or x is not determined.
- or [1] The equation $2x + 10 + 3x = 360$ is solved correctly, and an answer of 210 is found.
- or [1] 102, but no work is shown.
- [0] The equation $2x + 10 = 3x$ where $x = 10$ is given.
- or [0] A zero response is completely incorrect, irrelevant, or incoherent or is a correct response that was obtained by an obviously incorrect procedure.
-

- [3] A correct graph is shown, and an answer between -6° and -2° is found.
 - [2] A correct formula is used, and -4°C or an equivalent answer is found, but no graph is shown.
 - or [2] An appropriate graph is shown, and the correct answer is marked, but it is stated incorrectly, such as 5°C instead of -5°C .
 - or [2] An appropriate graph is shown, but answers outside the given range are found.
 - or [2] The line graph passes through at least one correct point, and an appropriate answer is found.
 - [1] The formula is used correctly, but the answer is not in the range, and no graph is shown.
 - or [1] An answer between -6° and -2° is found, but no graph is shown.
 - [0] A completely incorrect graph is shown.
 - or [0] No graph is shown and the formula is used incorrectly.
 - or [0] A zero response is completely incorrect, irrelevant, or incoherent or is a correct response that was obtained by an obviously incorrect procedure.
- [28] _____

- [3] 78.5 square feet or 25π or an equivalent answer, and appropriate work is shown.
 - [2] Appropriate work is shown, but one computational error is made.
 - or [2] Appropriate work is shown, but the measure of one side of the square is used as the radius of the circle.
 - or [2] Appropriate work is shown, but the perimeter is used to find a side of the square.
 - [1] The correct length of the side of the square is shown, but further work is missing or is incorrect.
 - or [1] The equation for the circumference of the circle instead of the equation for the area of the circle is solved appropriately.
 - or [1] Appropriate work is shown, but more than one error is made.
 - or [1] 78.5 square feet or 25π , 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 incorrect procedure.
- [29] _____

[3] $\frac{7}{20}$ or an equivalent answer, and

appropriate work is shown, such as $\frac{15}{25} \cdot \frac{14}{24}$

or $\frac{{}_{15}C_2}{{}_{25}C_2}$.

[2] $\frac{15}{25} \cdot \frac{14}{24}$ or $\frac{{}_{15}C_2}{{}_{25}C_2}$ is shown, but one

computational error is made or no further work is shown.

or [2] ${}_{15}C_2$ and ${}_{25}C_2$ are computed correctly, but no further work is shown.

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

[1] The correct probabilities are found, but they are added instead of multiplied.

or [1] Only one of the two parts of the probability is correct.

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

or [1] $\frac{7}{20}$ or an equivalent answer, 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

[30] incorrect procedure.

[4] 3, 5, and 7, and appropriate work is shown, such as an appropriate quadratic equation or trial-and-error method.

[3] An appropriate equation is written and solved, but one computational error is made.

or [3] An appropriate equation is written and solved, but the even solutions are also listed.

[2] An incorrect quadratic equation is shown, but it is solved appropriately.

or [2] Integers are misrepresented, but the subsequent quadratic equation is solved appropriately.

or [2] An appropriate equation is written and solved, but more than one computational error is made.

or [2] The correct solution is given, but only one trial is shown with appropriate checks when a trial-and-error method is used.

[1] A linear equation is solved appropriately.

or [1] 3, 5, and 7, 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.

[4] \$148.54, and appropriate work is shown.

[3] The correct pre-tax amount of \$137.54 is found, but no tax or an incorrect tax is shown.

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

[2] The correct area of 46 ft^2 is found, but no cost is shown.

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

or [2] An incorrect area is determined, such as by adding or multiplying all sides, but then a final cost including tax is determined appropriately.

[1] An incorrect area is shown, and one computational error is made.

or [1] \$148.54, 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.

- [4] \$5 for the sprayer and \$10 for the generator, and appropriate work is shown, such as $x =$ hourly cost of sprayer and $y =$ hourly cost of generator, and an appropriate system of equations is solved or a trial-and-error method is used, showing at least two trials with appropriate checks.
- [3] Both correct equations are shown or an appropriate chart or trial-and-error method is used, but one computational error is made.
- or [3] Both correct equations are shown, and they are solved for one value, but no further work is shown.
- [2] Only one of the two equations is correct, but they are solved appropriately for both values.
- or [2] Both correct equations are shown, but more than one computational error is made.
- or [2] \$5 for the sprayer and \$10 for the generator, but only one trial is shown with appropriate checks.
- [1] Both equations are incorrect, but they are solved appropriately for both values.
- or [1] Both correct equations are shown, but they are not solved.
- or [1] \$5 for the sprayer and \$10 for the generator, 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 incorrect procedure.
- [33] incorrect procedure.

- [4] 260, and appropriate work is shown, such as applying the appropriate area formula, or $A = \frac{1}{2}bh$ or $A = \frac{1}{2}h(b_1 + b_2)$, to find the length of \overline{AE} and using the Pythagorean theorem or stating the Pythagorean triple to determine AB .
- [3] 300, because \overline{BE} is added to the perimeter.
- or [3] Appropriate work is shown, but one computational error is made.
- [2] Appropriate work is shown, but more than one computational error is made.
- or [2] Only AB and AE are determined correctly.
- [1] Only AB or AE is determined correctly.
- or [1] 260, 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 incorrect procedure.
- [34] incorrect procedure.

[4] $S'(0,6)$, $U'(-3,5)$, $N'(-3,0)$, and the correct graphs of both triangles are shown.

[3] The correct graphs of both triangles are shown, but the coordinates of $\Delta S'U'N'$ are not stated correctly.

or [3] ΔSUN is graphed and labeled correctly, and the coordinates of $\Delta S'U'N'$ are stated correctly but not graphed correctly.

or [3] The coordinates of $\Delta S'U'N'$ are graphed and stated correctly, but ΔSUN is not graphed or labeled.

or [3] ΔSUN is graphed incorrectly, but the graph and the coordinates of $\Delta S'U'N'$ are appropriate, based on that error.

[2] $\Delta S'U'N'$ is graphed correctly, but the coordinates of $\Delta S'U'N'$ are not stated, and ΔSUN is not graphed.

or [2] ΔSUN is graphed and labeled correctly, but $\Delta S'U'N'$ is reflected in the x-axis, and the coordinates

$S'(0,-6)$, $U'(3,-5)$, $N'(3,0)$ are stated.

or [2] ΔSUN is graphed incorrectly, but $\Delta S'U'N'$ is graphed appropriately, based on that error, but the coordinates of $\Delta S'U'N'$ are not stated.

[1] ΔSUN is graphed and labeled correctly, but no other work or completely incorrect work for $\Delta S'U'N'$ is shown.

or [1] $\Delta S'U'N'$ is graphed correctly, but the coordinates of $\Delta S'U'N'$ are not stated, and ΔSUN is not graphed or is graphed incorrectly.

or [1] $S'(0,6)$, $U'(-3,5)$, $N'(-3,0)$, but no work or graph 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.