

ACT Countdown #1

1. If $\log_{10} x = 4$, then $x =$?
- A. 4^{10}
 - B. 10,000
 - C. 40
 - D. $\frac{10}{4}$
 - E. $\frac{4}{10}$
2. An exam worth 235 points contains 50 questions. Some of the questions are worth two points and some are worth five points. How many five point questions are on the test?
- F. 35
 - G. 45
 - H. 15
 - J. 25
 - K. 10
3. If $f(x) = 3x + 1$ and $g(x) = \frac{x-1}{3}$, then $f(g(x)) =$?
- A. $\frac{(3x+1)(x-1)}{3}$
 - B. $\frac{5x+1}{2}$
 - C. $\frac{6x+2}{x-1}$
 - D. $\frac{x-1}{6x+2}$
 - E. x

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ACT Countdown #2

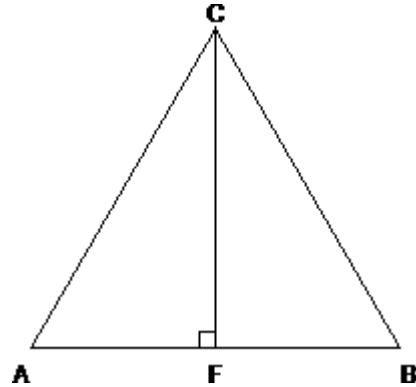
1. The graph of which of the following equations is a straight line parallel to the graph of $y = -x$?

- A. $2x - y = 4$
- B. $2x - 2y = 2$
- C. $2x + y = 2$
- D. $4x + 4y = 4$
- E. $4x - 4y = 4$

2. Which of the following expressions is equivalent to $b(5 - b) - 2(b + 8)$?

- F. $-2b - 16$
- G. $-2b + 8$
- H. $-b^2 + 3b - 16$
- J. $-b^2 + 3b + 8$
- K. $-2b^2 - 16$

3. In the figure below $\overline{AC} \cong \overline{BC} \cong \overline{AB}$. \overline{AB} is 10 units long. What is the area, in square inches, of $\triangle ABC$?



- A. 12.5
- B. 20
- C. 25
- D. $25\sqrt{2}$
- E. $25\sqrt{3}$

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ACT Countdown #2

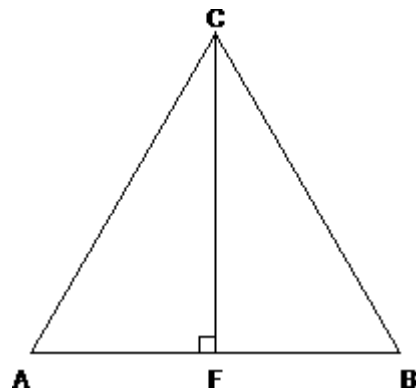
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ACT Countdown #3

1. Four students are lined up by height so that their heights are in consecutive numerical order from shortest to tallest. If the sum of their heights is 226 inches, what is the height of the tallest student?
- A. 52
B. 54
C. 56
D. 58
E. 60
2. Saying that $5 < \sqrt{x} < 8$ is equivalent to saying what about x ?
- F. $0 < x < 6$
G. $0 < x < 25$
H. $3 < x < 4$
J. $5 < x < 8$
K. $25 < x < 64$
3. A bag contains 20 different colored marbles: 7 red, 8 blue, and 5 green. One marble will be randomly selected from the bag. What is the probability the marble picked is NOT blue?
- A. $\frac{1}{4}$
B. $\frac{2}{5}$
C. $\frac{1}{2}$
D. $\frac{3}{5}$
E. $\frac{4}{5}$

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ACT Countdown #4

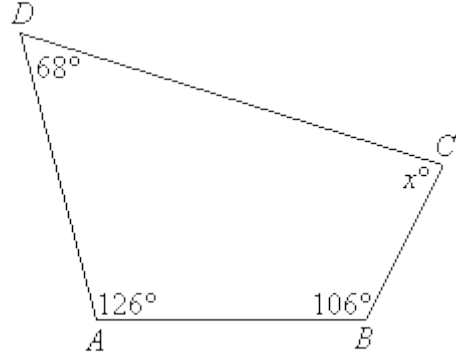
1. Jane is bowling in a tournament and has the highest average after 5 games, with scores of 220, 225, 264, 241, and 280. In order to maintain this exact average, what must be Jane's score for her 6th game?

- A. 210
- B. 241
- C. 246
- D. 250
- E. 265

2. 30% of 280 is equal to 70% of what number?

- F. 364
- G. 300
- H. 196
- J. 154
- K. 120

3. The figure below shows quadrilateral ABCD. What is the measure of $\angle C$?



- A. 120°
- B. 100°
- C. 90°
- D. 80°
- E. 60°

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ACT Countdown #4

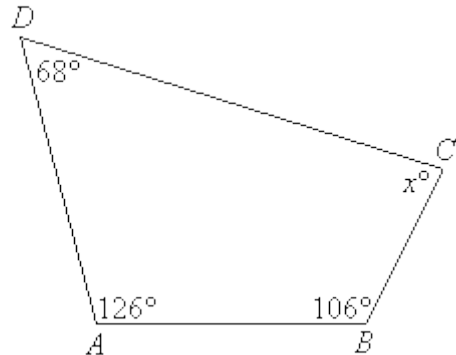
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ACT Countdown #5

1. A ladder is leaned against a wall. The ladder is 15 ft. long and reaches 12 ft. up the wall. How many feet is the bottom of the ladder from the base of the wall?
- A. 3
B. 4
C. 9
D. 15
E. $\sqrt{369}$
2. Solve the following equation: $x^2 + 20 = 4$.
- F. $\sqrt{24}$
G. -4
H. ± 4
J. ± 24
K. no real solutions
3. If $90^\circ < x < 180^\circ$ and $\sin x = \frac{8}{17}$, then $\cos x = ?$
- A. $\frac{15}{17}$
B. $\frac{8}{15}$
C. $-\frac{8}{17}$
D. $-\frac{15}{17}$
E. $-\frac{8}{15}$

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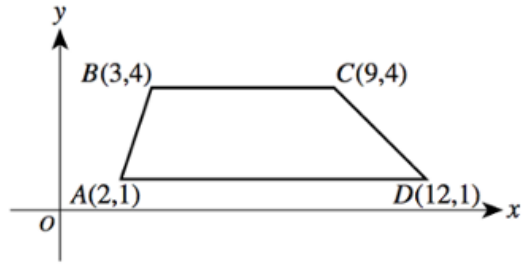
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ACT Countdown #6

1. Evaluate: $(-1) + 2^2 \times -3$
- A. -13
 - B. -3
 - C. 0
 - D. 3
 - E. 13

2. A circle in the standard (x, y) coordinate plane is tangent to the x -axis at -4 and tangent to the y -axis at 4 . Which of the following is an equation of the circle?
- F. $x^2 + y^2 = 4$
 - G. $x^2 + y^2 = 16$
 - H. $(x + 4)^2 + (y - 4)^2 = 4$
 - J. $(x + 4)^2 + (y - 4)^2 = 16$
 - K. $(x - 4)^2 + (y + 4)^2 = 16$

3. Trapezoid $ABCD$ is graphed in the standard (x, y) coordinate plane below.



When $ABCD$ is reflected over the y -axis to $A'B'C'D'$, what are the coordinates of D' ?

- A. $(-12, 1)$
- B. $(-12, -1)$
- C. $(12, -1)$
- D. $(1, 12)$
- E. $(1, -12)$

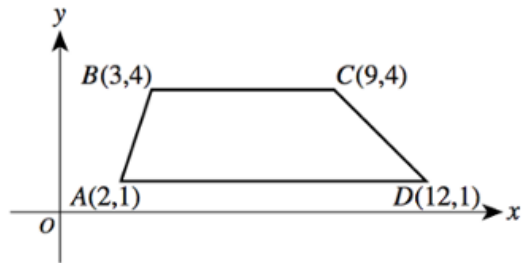
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ACT Countdown #7

- In the school cafeteria, students choose their lunch from 4 sandwiches, 2 soups, 2 salads, and 5 drinks. How many different lunches are possible for a student who chooses exactly 1 sandwich, 1 soup, 1 salad, and 1 drink?
 - 5
 - 8
 - 16
 - 40
 - 80
 - What is the greatest common factor of 21, 84, and 357?
 - 1
 - 3
 - 7
 - 21
 - 84
 - You have an empty cylinder with a base diameter of 6 cm and a height of 10 cm and you have a cone full of water with a base radius of 3 cm and a height of 10 cm. If you empty the cone of water into the cylinder, how much volume is left empty in the cylinder?
 - 120π
 - 60π
 - 90π
 - 30π
 - 45π
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ACT Countdown #8

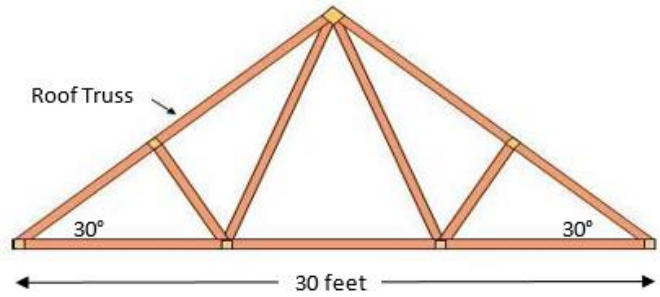
1. If x and y are real numbers such that $x > 2$ and $y < -2$, then which of the following inequalities must be true?

- A. $\frac{x}{y} > 1$
- B. $|x|^2 > |y|$
- C. $\frac{x}{3} - 4 > \frac{y}{3} - 4$
- D. $x^2 + 2 > y^2 + 2$
- E. $x^{-2} > y^{-2}$

2. The inequality $2(x - 1) > 3(x + 2)$ is equivalent to which of the following inequalities?

- F. $x < -3$
- G. $x < -1$
- H. $x < 1$
- J. $x < 14$
- K. $x < -8$

3. Which of the following is an expression for the total perimeter, in feet, of the roof truss shown below?



- A. $30 + 10\sqrt{3}$
- B. $30 + 20\sqrt{3}$
- C. $30 + 30\sqrt{3}$
- D. 90
- E. $40\sqrt{3}$

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ACT Countdown #8

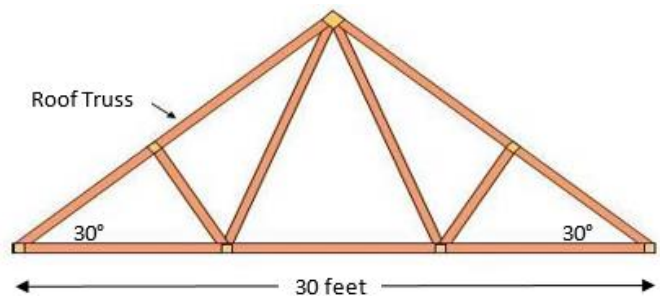
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ACT Countdown #9

- How many irrational numbers are between 1 and 8?
 - 0
 - 1
 - 2
 - 4
 - Infinitely many
 - Oscar's retirement party will cost \$84 if he invites 6 guests. What is the maximum number of guests Oscar can invite if he spends a total of \$210 on the party?
 - 13
 - 14
 - 15
 - 16
 - 17
 - Simplify the following expression:
$$\left(\frac{3x^2y}{6x^4}\right)^{-2} \left(\frac{x^{-3}y}{2xy^4}\right)$$
 - $\frac{1}{y^5}$
 - $8x^2y$
 - $\frac{1}{8x^2y}$
 - $\frac{2}{y^5}$
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-
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ACT Countdown #10

1. Find the given root of the following expression. Assume that all variables represent positive numbers: $\sqrt[3]{-64x^{36}y^{18}}$.
- A. $-4x^{12}y^6$
 - B. $16x^{12}y^6$
 - C. $4x^{12}y^6$
 - D. $-4x^{18}y^9$
 - E. $-8x^{12}y^6$
2. An equation of the line that contains the origin and the point (1,3) is
- F. $y = 3x$
 - G. $3y = x$
 - H. $y = x - 1$
 - J. $y = 3x + 1$
 - K. $x - 3y = 4$
3. If $\left(\frac{1}{9} + \frac{1}{3}\right) + \left(\frac{1}{2} - \frac{1}{4}\right)$ is calculated and the answer reduced to simplest terms, what is the denominator of the resulting fraction?
- A. 4
 - B. 25
 - C. 27
 - D. 36
 - E. 216

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