

- 11** The height (h) of an object after t seconds is given by the equation $h = -2t^2 - 9t + 56$? In how many seconds will the object strike the ground?

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- 12** A scale model of a rectangular plot of land is 13 inches long by 12 inches wide. If the actual length of this plot is 780 feet, what is its actual area, in square feet?

- (F) 9,360
(G) 121,680
(H) 406,080
(I) 561,600

- 13** Set A contains 20 elements, set B contains 15 elements, and set $A \cap B$ contains 6 elements. How many elements are contained in the set $A \cup B$?

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- 14** In factoring the expression $12x^2y^3 + 20x^3y$, which of the following is the greatest common factor?

- (F) $8x^3y^3$
(G) $8x^2y$
(H) $4x^2y$
(I) $4xy$

- 15** Given the equation $A = B + C^2D$, which of the following is the correct expression for D ?

- (A) $A - B - C^2$
(B) $A + B + C^2$
(C) $\frac{A - B}{C^2}$
(D) $\frac{C^2}{A - B}$

Answers

- 11** The correct answer is 3.5. Substitute $h = 0$ into the equation. Then $0 = -2t^2 - 9t + 56$. The right side can be factored so that $0 = -1(2t - 7)(t + 8)$. So, $2t - 7 = 0$ or $t + 8 = 0$. Use only the positive value of t . If $2t - 7 = 0$, then $2t = 7$. Thus, $t = 3.5$. (The other answer of $t = -8$ is rejected.)

- 12** (I)

Let x represent the actual width, in feet. Then $\frac{13}{12} = \frac{780}{x}$. Cross-multiply to get $13x = 9,360$. So $x = \frac{9,360}{13} = 720$. Thus, the actual area is given by $(780)(720) = 561,600$ square feet.

- 13** The correct answer is 29. The cardinality of any set X is denoted as $n(X)$. For any two sets A and B , $n(A \cup B) = n(A) + n(B) - n(A \cap B)$. By substitution, $n(A \cup B) = 20 + 15 - 6 = 29$.

- 14** (H)

$12 = 2^2 \times 3$ and $20 = 2^2 \times 5$. Their greatest common factor is $2^2 = 4$. For each of the variables, the greatest common factor is the lowest exponent in either expression. Then the greatest common factor for the variables x and y is x^2y . Thus, the greatest common factor for both terms is $4x^2y$.

- 15** (C)

The first step in solving for D is to subtract B from each side. Then $A - B = C^2D$. The second (and final step) is to divide each side by C^2 . Thus, $\frac{A - B}{C^2} = D$.