

# Comprehensive Algebra Drill

The answers can be found in Part IV.

3. If  $x + y = 4$  and  $x - y = 2$ , then  $x^2 - y^2 =$
- (A) 4  
(B) 6  
(C) 8  
(D) 12  
(E) 20
9. If  $(x + 4)^2 = 63$ , then  $x =$
- (A)  $-1.63$   
(B)  $-0.63$   
(C)  $1.78$   
(D)  $3.94$   
(E)  $6.1$
15. What are all the values of  $x$  for which  $|x + 5| < 2$ ?
- (A)  $x > -3$  or  $x < -7$   
(B)  $x < -7$   
(C)  $x > -3$   
(D)  $-7 < x < -3$   
(E)  $-3 < x < 7$
19. If  $a + 3b + 6c = 12$ ,  $-2a + b - c = 5$ , and  $4a - 2b - 4c = 1$ , then  $3a + 2b + c =$
- (A)  $-10$   
(B)  $0$   
(C)  $10$   
(D)  $16$   
(E)  $18$
20. For what value of  $x$  is  $\frac{5x}{4x - 2}$  undefined?
- (A)  $-1$   
(B)  $-\frac{1}{2}$   
(C)  $0$   
(D)  $\frac{1}{2}$   
(E)  $1$
23. If  $x \neq 0$ , then  $(2^{3x})(8^{2x}) =$
- (A)  $2^{5x}$   
(B)  $2^{6x}$   
(C)  $2^{9x}$   
(D)  $8^{5x}$   
(E)  $16^{5x}$
24. A train traveled 500 miles at an average speed of 60 miles per hour. Approximately how much longer would this same 500-mile trip take if the average speed had decreased by 25%?
- (A)  $3\frac{1}{2}$  hours  
(B)  $2\frac{7}{8}$  hours  
(C)  $2\frac{3}{4}$  hours  
(D)  $1\frac{3}{4}$  hours  
(E) 1 hour
25. If  $y$  is directly proportional to  $x^3$  and  $y = 1.2$  when  $x = 4$ , what is the value of  $y$  when  $x = 12$ ?
- (A)  $0.04$   
(B)  $22.4$   
(C)  $32.4$   
(D)  $37.6$   
(E)  $40.1$
27. If  $j$  and  $k$  are both odd integers, which of the following must also be an odd integer?
- (A)  $(j + k)^5$   
(B)  $(j + k)^4$   
(C)  $j^5 + k^5 + 1$   
(D)  $j^4 + k^4 + 2$   
(E)  $\frac{j^5 + k^5}{5}$

30. The sum of the two roots of a quadratic equation is 6 and their product is 8. Which of the following could be the equation.
- (A)  $x^2 - 6x + 8 = 0$
  - (B)  $x^2 + 8x - 6 = 0$
  - (C)  $x^2 - 8x + 6 = 0$
  - (D)  $x^2 + 6x - 8 = 0$
  - (E)  $x^2 - 6x - 8 = 0$
36. The distance, in feet, that an object travels is a function of the time over which it travels. In the equation  $d(t) = at + \frac{1}{2}bt^2$ ,  $d(t)$  represents the distance, in feet, traveled,  $t$  represents the time, in seconds, spent traveling, and  $a$  and  $b$  are constants. If  $a = 10$  m/s and  $b = 4$  m/s<sup>2</sup>, which of the following is the closest approximation to the time it would take, in seconds, for an object to travel 36 feet?
- (A) 0.8
  - (B) 1.8
  - (C) 2.4
  - (D) 4.6
  - (E) 8.4