

1. In the inequality $5x + 2 < 2x + 5$, all of the following may be a value for x except which number?
(A) 0 (B) -3 (C) -1
(D) -2 (E) 1
2. A golfer makes 10 putts in her first 18 attempts. If she continues at the same rate, how many putts will she make in 45 attempts?
(A) 25 (B) 30 (C) 21
(D) 28 (E) 18
3. Suppose $x > y$ and $xy < 0$. Which of the following must be negative?
(A) y (B) x (C) $x - y$
(D) $x^2 - y^2$ (E) $(y - x)^2$
4. Find the value of x that satisfies both of the following equations:
 $x + m = 8$ and $m - x = 4$.
(A) 2 (B) 4 (C) 5
(D) 6 (E) 8
5. A diagram of a playground is drawn to the scale of 0.5 inches equals 80 ft. If the length of the diagram is 4.5 inches, what is the actual length (in feet) of the playground?
(A) 320 (B) 360 (C) 640
(D) 680 (E) 720
6. A number is divided by half of itself, and the result is 2. What is the number?
(A) 0 (B) just 1
(C) just 1 or 2 (D) no number
(E) every number except 0
7. Find the missing term in the proportion:
$$\frac{\frac{2}{3}}{5} = \frac{x}{12}$$

(A) $\frac{8}{5}$ (B) $\frac{5}{8}$ (C) $\frac{5}{36}$
(D) $\frac{36}{5}$ (E) 20
8. Evaluate $\frac{a+c}{a-c}$ for $a = 2/3$ and $c = 5/7$.
(A) 29 (B) -1 (C) -29
(D) $-7/3$ (E) $-14/15$
9. If $-c/3 = -5$, then $-3c = ?$
(A) 45 (B) 15 (C) -45
(D) -15 (E) 0
10. If $A = C - 6$, then in terms of C , $A - 2 = ?$
(A) $C - 8$ (B) $C - 2$ (C) $C + 4$
(D) $C + 6$ (E) $C + 8$
11. If the average of a and b is 0, then which of the following could be true?
(A) $a < 0, b < 0$ (B) $a > 0, b > 0$
(C) $a < 0, b > 0$ (D) $a = 0, b > 0$
(E) none of these
12. Find the sum of the factors of $r^2 - 18r + 77$.
(A) $2r - 18$ (B) $2r + 22$
(C) -18 (D) 18 (E) 77

13. Find the point of intersection of the lines whose equations are:
 $7x - 3y = 26$
 $2x + 5y = 25$
- (A) $(-5, -\frac{61}{3})$ (B) $(2, -4)$
(C) $(5, 3)$ (D) $(-5, 7)$
(E) none of these
14. It takes h hours to mow a lawn. What part of the lawn is mowed in one hour?
- (A) h/x (B) $1/h$ (C) x/h
(D) h (E) hx
15. Subtract and reduce to lowest terms:
 $\frac{1}{x} - \frac{x}{2y}$
- (A) $\frac{2y - x}{2xy}$ (B) $\frac{2y - x^2}{2xy}$
(C) 0 (D) 1 (E) none of these
16. Five times what number, when decreased by half itself, equals 18?
- (A) 2 (B) 4 (C) 6 (D) 8
(E) none of these
17. Factor completely: $2x^2 + 3x - 2$
- (A) $(2x + 1)(x - 2)$
(B) $(2x - 1)(x - 2)$
(C) $(2x + 1)(x + 2)$
(D) $(2x - 1)(x + 2)$
(E) none of these
18. The sum of six consecutive odd numbers exceeds twice the largest by 38. Find the sum of the numbers.
- (A) 42 (B) 50 (C) 57
(D) 60 (E) 72
19. For how many natural numbers, N , is $\frac{1}{3} < \frac{N}{19} < \frac{5}{7}$?
- (A) fewer than 10 (B) 61
(C) 399 (D) more than 400
(E) none of these
20. There are 240 people at a picnic. There are 20 more men than women, and there are 20 more adults than children. How many men are at this picnic?
- (A) 240 (B) 130 (C) 110
(D) 75 (E) 200
21. A total of \$10,000 is invested in two bond accounts, A and B. Bond A pays a 6% rate, while Bond B pays a 9% rate. The interest on the two accounts totals \$852. How much is invested in each of the bond accounts?
- (A) A: \$2000; B: \$8000
(B) A: \$1600; B: \$8400
(C) A: \$5000; B: \$5000
(D) A: \$6000; B: \$4000
(E) A: \$1000; B: \$9000

22. Solve: $\frac{3x}{x-4} = 5 + \frac{12}{x-4}$
- (A) 4 (B) 4 or 3 (C) 3
 (D) 0 (E) none of these
23. Given that $-2 < x < 3$, which of the following is true?
- (A) $2 > -x > -3$ (B) $4 < x^2 < 9$
 (C) $\frac{-1}{2} > \frac{1}{x} > \frac{1}{3}$
 (D) all of these (E) none of these
24. The graphs of:
 $3x + 2y = 2$ and $2y = -3x - 8$:
- (A) have the same x-intercept
 (B) are parallel
 (C) are the same line
 (D) intersect at a right angle
 (E) have the same y-intercept
25. For the function $f(x) = x^2 - 8x - 9$, find any values of x for which $f(x) = 0$.
- (A) Just 9 (B) 9 or -1
 (C) Just 1 (D) -9 or 1
 (E) Just -9
26. A straight line goes through the points $(-3, 7)$ and $(-4, 0)$. The equation of the line is:
- (A) $3x - y = 2$ (B) $7x + 7y = 21$
 (C) $7x + 28 = y$ (D) $y + 4 = x$
 (E) none of these
27. If $y \mu x$ is defined to be $y^2 - 3x$, find: $(2 \mu 3) \mu 2$.
- (A) 30 (B) 19 (C) -1
 (D) -6 (E) -7
28. If $a > b > c > 0$, then which of the following is always true?
- (A) $c - b > a$ (B) $ab > c$
 (C) $a + b > c$ (D) $c \div b > 2$
 (F) none of these
29. Find the equation of the line that is perpendicular to $3x + 2y = 6$ and goes through the point $(-1, 2)$.
- (A) $3x - 2y = 8$
 (B) $3x + 2y = -8$
 (C) $3x - 2y = -8$
 (D) $2x + 3y = 8$
 (E) $2x - 3y = -8$
30. A train traveling at 30 miles per hour is stopped 1.5 miles from its destination at 1:00 P.M. At what time would the train have arrived at its destination if it had been able to make the entire trip at 30 miles per hour with no delay?
- (A) 1:02 (B) 1:03 (C) 1:04
 (D) 1:45 (E) 2:20

31. What is the total weight, in ounces, of a package containing a book that weighs p pounds and wrapping material that weighs n ounces?
- (A) $16(p + n)$ (B) $16n + p$
 (C) $n + \frac{p}{16}$ (D) $n + \frac{16}{p}$
 (E) $16p + n$
32. Jack is three times as old as Jill. If Jill was x years old three years ago, how old is Jack now?
- (A) x (B) $x + 3$ (C) $3x + 3$
 (D) $3x + 9$ (E) $3x + 12$
33. Factor completely:
 $2rs + 3rst - 8r - 12rt$
- (A) $r(2s + 3st - 8 - 12rt)$
 (B) $(rs - 4r)(2 + 3t)$
 (C) $r(s - 4)(2 - 3t)$
 (D) $r(s - 4)(2 + 3t)$
 (E) none of these
34. Find all the numbers that are 2 units apart and their total is 7.
- (A) $1/4, 7/5$ (B) $2/3, 2$
 (C) $3/4, 3/2$ (D) $5/2, 9/2$
 (E) no solution
35. The statement x is approximately 1.5 implies that the value of x is:
- (A) 1.5 (B) $1.4 \# x < 1.6$
 (C) $1 \# x < 2$ (D) $0.5 \# x < 2.5$
 (E) $1.45 \# x < 1.55$
36. When a train covers the distance D between two cities in H hours, it arrives 2 hours late. What rate would allow the train to arrive on time?
- (A) $H - 2$ (B) $DH - 2$
 (C) $\frac{D}{H} - 2$ (D) $\frac{D}{H - 2}$
 (E) $\frac{D}{H + 2}$
37. If $x = -2$ and $1 \div n = -4$, what is the value of n in terms of x ?
- (A) $x - 6$ (B) $2x$ (C) $x \div 2$
 (D) $1 \div 2x$ (E) $x + 6$
38. After 200 throws, a coin has shown heads exactly 110 times. How many consecutive heads must now be thrown for heads to have shown for exactly 70% of the total number of throws?
- (A) 30 (B) 300 (C) 220
 (D) 100 (E) None of these
39. Given that a and b are real numbers, let $f(a,b) = ab$, and $g(a) = a^2 + 2$. Then $f[3, g(3)] = ?$
- (A) $3a^2 + 2$ (B) $3a^2 + 6$
 (C) 27 (D) 29 (E) 33
40. Subtract: $\frac{2}{x-3} - \frac{1}{x+2}$
- (A) $\frac{1}{(x-3)(x+2)}$ (B) $\frac{x-1}{(x-3)(x+2)}$
 (C) $\frac{x+7}{(x-3)(x+2)}$ (D) $\frac{x+1}{(x-3)(x+2)}$
 (E) none of these