

1.  $0.7 + 0.04 + 0.2$  equals  
 (A) 0.742      (B) 0.94      (C) 0.904      (D) 0.76      (E) 0.15
2. How many tenths are equal to  $\frac{1}{2} + \frac{4}{5}$ ?  
 (A) 6      (B) 9      (C) 10      (D) 13      (E) 12
3. How much money must be placed at 5% simple interest for one year in order to earn \$15?  
 (A) \$150      (B) \$300      (C) \$500      (D) \$750      (E) \$1500
4.  $\frac{3}{4} - \frac{1}{12}$  equals  
 (A)  $\frac{1}{48}$       (B)  $\frac{1}{8}$       (C)  $\frac{2}{9}$       (D)  $\frac{3}{8}$       (E)  $\frac{3}{4}$
5. The law of the lever can be expressed by the equation,  $EA = rs$ . What is the value of  $s$  when  $r = 10$ ,  $E = 30$ , and  $A = 20$ ?  
 (A)  $\frac{3}{2}$       (B)  $\frac{20}{3}$       (C) 3      (D) 30      (E) 60
6. What fraction, in lowest terms, is equal to 0.80?  
 (A)  $\frac{1}{80}$       (B)  $\frac{40}{50}$       (C)  $\frac{4}{5}$       (D)  $\frac{1}{10}$       (E)  $\frac{2}{25}$
7.  $p + r(7p)$  equals  
 (A)  $p + 7r + rp$       (B)  $7p^2 + 7rp$       (C)  $8p + r$   
 (D)  $p + 7rp$       (E)  $8p + 7r$
8. The gravitational potential,  $P$ , of an object is equal to the product of its mass,  $M$ , and the negative of the gravitational constant,  $G$ , divided by the distance,  $R$ . Written as a formula this statement is  
 (A)  $P = \frac{-G + M}{R}$       (B)  $\frac{P}{R} = -GM$       (C)  $P = \frac{-GM}{R}$   
 (D)  $\frac{P}{R} = -G + M$       (E)  $P = -GMR$
9.  $x^4 \cdot x^3$  equals  
 (A)  $x^{24}$       (B)  $x^7$       (C)  $12x^7$       (D)  $12x$       (E)  $x^{12}$
10. What is the value of  $x$  in the equation  $5 + 2x = 4x - 15$ ?  
 (A) 10      (B) -10      (C) 5      (D) -5      (E) 0
11.  $(3x^2 - 4x) - (2x^2 + 5x - 6)$  equals  
 (A)  $x^2 + 9x + 6$       (B)  $x^2 - 9x - 6$       (C)  $5x^2 - 9x + 6$   
 (D)  $x^2 - 9x + 6$       (E)  $x^2 + 9x - 6$

12. If  $y$  varies directly as  $x$ , and  $y = 25$  when  $x = 5$ , what does  $y$  equal when  $x = 15$ ?  
 (A) 75 (B) 5 (C) 30 (D) 50 (E) 100
13.  $(m^2 - 6m + 2)(4m - 3)$  equals  
 (A)  $4m^3 - 6m - 3$  (B)  $4m^2 - 6$  (C)  $4m^2 - 24m - 6$   
 (D)  $4m^3 - 24m^2 + 18m - 6$  (E)  $4m^3 - 27m^2 + 26m - 6$
14. When simplified  $\frac{-(xy) - yz}{-y}$  equals  
 (A)  $-xy^2 + zy^2$  (B)  $-x - z$  (C)  $x - yz$   
 (D)  $-(xy) - z$  (E)  $x + z$
15. If  $5(x - 3) = 4 - (7 + x)$ , then  $x$  must equal  
 (A) 16 (B) 5 (C) 7 (D) 2 (E)  $\frac{5}{4}$
16. The volume,  $V$ , of a square pyramid (pentahedron) is equal to the product of the altitude, the square of the side length, and  $\frac{1}{3}$ . Using  $a$  for the altitude and  $l$  for the side length, a formula for  $V$  is given by  
 (A)  $V = \frac{1}{3}al^2$  (B)  $V = \frac{1}{3}(h + l)^2$  (C)  $V = \frac{1}{3}a + l^2$   
 (D)  $V = \frac{1}{3}(a + l^2)$  (E)  $V = \frac{1}{3}la^2$
17. If  $x = 5y$  and  $y \neq 0$ , the fraction  $\frac{2x - y}{x + 4y}$  is equal to  
 (A)  $-2y$  (B) 1 (C) 2 (D)  $-\frac{1}{4}$  (E)  $\frac{1}{4}$
18. In the formula  $V = \frac{C - q}{M}$ , what is the value of  $q$  when  $V = 5$ ,  $M = 3$ ,  $C = 19$ ?  
 (A)  $-4$  (B) 3 (C)  $\frac{16}{5}$  (D) 12 (E) 4
19. When simplified,  $\frac{x^2 - 4}{x^2 - 7x + 10}$  equals  
 (A)  $\frac{1}{-7x + 6}$  (B)  $\frac{x - 2}{x - 5}$  (C)  $\frac{x + 2}{x - 5}$  (D)  $\frac{-4}{-7x + 10}$  (E)  $\frac{x - 5}{x + 2}$
20.  $(12x^2 + 5xy - 2y^2)$  divided by  $(3x + 2y)$  equals  
 (A)  $4x + \frac{5}{3}y - \frac{5}{2}x - y$  (B)  $4x^2 - y^2$  (C)  $4x - y$   
 (D)  $4x + \frac{5}{3}y + \frac{5}{2}x - y$  (E)  $4x + \frac{10xy}{6} - y$
21. If the sum of the two dimensions of a rectangle is 13 and the area of the rectangle is 42, one of the dimensions is  
 (A) 8 (B) 7 (C) 3.2 (D) 12 (E) 4

22. What is the value of  $27^{2/3}$ ?  
 (A)  $54 \frac{1}{3}$  (B)  $30 \frac{1}{3}$  (C) 9 (D) 36 (E)  $10 \frac{1}{3}$
23. When simplified,  $(\frac{5+2y}{y}) - (\frac{2x+y}{x})$  equals  
 (A)  $\frac{5y-2x}{y+x}$  (B)  $\frac{5-2x}{y-x}$  (C)  $\frac{10x+3y}{y-x}$  (D)  $\frac{5x-y^2}{xy}$  (E)  $\frac{5+2y^2-2x}{yx}$
24.  $-(a+b) - b(-a)$  equals  
 (A)  $-a-b+ba$  (B)  $-2a-2b$  (C)  $-ba-b-a$   
 (D)  $b-a-ab$  (E) 0
25. If  $ab = \frac{5}{7}$  and  $ac = \frac{3}{7}$  what does  $\frac{b}{c}$  equal?  
 (A)  $\frac{5}{3}$  (B)  $\frac{49}{15}$  (C)  $\frac{1}{7}$  (D)  $\frac{15}{49}$  (E) 7
26.  $(\sqrt{x-a} - \sqrt{x})(\sqrt{x-a} + \sqrt{x})$  equals  
 (A)  $-a$  (B)  $x-a$  (C)  $a+x$  (D)  $a + \sqrt{-a} - x$  (E)  $x$
27.  $\frac{(x^3)^4}{x^2}$  equals  
 (A)  $x^5$  (B)  $x^{10}$  (C) 43 (D)  $x^{79}$  (E) 6
28. If the perimeter of a square with side  $s$  is equal to the perimeter of an equilateral triangle with side  $x$  what does  $s$  equal in terms of  $x$ ?  
 (A)  $s = \frac{16x}{9}$  (B)  $s = x-1$  (C)  $s = \frac{x}{12}$   
 (D)  $s = \frac{3x}{4}$  (E)  $s = \sqrt{x}$
29.  $4\sqrt{5} + 6\sqrt{20}$  equals  
 (A)  $12\sqrt{5}$  (B)  $16\sqrt{5}$  (C)  $39\sqrt{5}$  (D)  $10\sqrt{5}$  (E)  $10\sqrt{25}$
30. If  $\frac{xq-p}{6} = R$ , then  $x$  equals  
 (A)  $\frac{6R}{p} - q$  (B)  $\frac{R(6+p)}{q}$  (C)  $\frac{6R}{q-p}$   
 (D)  $6R - (q-p)$  (E)  $\frac{6R+p}{q}$

31. What is the value of  $x$  in the simultaneous equations  
 $4x + 2y - 20 = 0$   
 $3x + y = -8$   
(A) -18      (B) 12      (C) 4      (D) 46      (E) 7
32. If the square root of  $(x^2 + ax + b)$  is  $(x + 2)$ , what is the value of  $b$ ?  
(A) 8      (B) -1      (C) 4      (D) 1      (E) 0
33. If the numerical value of the volume of a cube is 27, what is the numerical value of the area of one of its faces?  
(A) 3      (B) 9      (C) 18      (D)  $4\frac{1}{2}$       (E)  $13\frac{1}{2}$
34. If  $x^2 - y^2 = -15$  and  $x^2 + y^2 = 17$ , then  $x^4 - y^4 =$   
(A) 2      (B) 1      (C) 256      (D) 0      (E) -255
35. If the length of a hypotenuse of a right triangle is 39 and one leg is  $\frac{1}{3}$  the hypotenuse, how long is the other leg?  
(A)  $13\sqrt{3}$       (B)  $2\sqrt{3}$       (C)  $26\sqrt{2}$       (D)  $13\sqrt{2}$       (E) 13
36. If a train runs  $M$  miles in 3 hours, how many miles will it run in  $K$  hours at the same rate?  
(A)  $\frac{K}{3M}$       (B)  $\frac{3M}{K}$       (C)  $\frac{KM}{3}$       (D)  $\frac{M}{3K}$       (E)  $\frac{3K}{M}$
37. If  $x$  is greater than 5, which of the following is the smallest?  
(A)  $\frac{5}{x+1}$       (B)  $\frac{x+1}{5}$       (C)  $\frac{5}{x}$       (D)  $\frac{5}{x-1}$       (E)  $\frac{x}{5}$
38. If the roots of the equation  $2x^2 + 5x - 3 = 0$  are added together, the sum is  
(A) -2      (B)  $-2\frac{1}{2}$       (C) 4      (D) 2      (E)  $3\frac{1}{2}$
39. If the numerical values of the circumference and area of a circle are equal, what is the measure of the radius of the circle?  
(A)  $\frac{1}{2}$       (B)  $\pi$       (C) 1      (D)  $\frac{1}{4}$       (E) 2
40. If  $x - 2$  is a factor of  $x^2 + 5x + p$  what is the value of  $p$ ?  
(A) 3      (B) -14      (C) 10      (D) -10      (E) 14

## Placement Test Answer Key

1. B
2. D
3. B
4. E
5. E
6. C
7. D
8. C
9. B
10. A
11. D
12. A
13. E
14. E
15. D
16. A
17. B
18. E
19. C
20. C
21. B
22. C
23. D
24. A
25. A
26. A
27. B
28. D
29. B
30. E
31. A
32. C
33. B
34. E
35. C
36. C
37. A
38. B
39. E
40. B