PRACTICE TEST B

60 minutes – 60 questions

Directions: Answer each question. Choose the correct answer from the 5 choices given. Do not spend too much time on any one problem. Solve as many as you can; then return to the unanswered questions in the time left. Unless otherwise indicated, all of the following should be assumed:

- All numbers used are real numbers.
- The word *average* indicates the arithmetic mean.
- Drawings that accompany problems are intended to provide information useful in solving the problems. Illustrative figures are not necessarily drawn to scale.
- The word *line* indicates a straight line.

DO YOUR FIGURING HERE.

1. The distance between the points $(1,0)$ and $(5, -3)$ is:

    A. $\sqrt{5}$
    B. $\sqrt{10}$
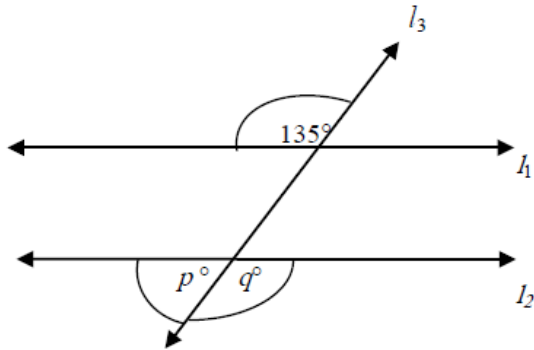   C. $2\sqrt{5}$
    D. 5
    E. 25

2. $\left(\dfrac{1}{3}\right)^4 - \left(\dfrac{1}{3}\right)^3 = ?$

    F. $\dfrac{1}{3}$

    G. $\dfrac{1}{9}$

    H. $\dfrac{1}{81}$

    J. $-\dfrac{2}{81}$

    K. $-\dfrac{1}{3}$

3. In the figure $l_1 \parallel l_2$ and l_3 is a transversal.
    What is the value of $q - p$?

l_3

135°

l_1

$p°$ $q°$

l_2

A.   0°
B.   45°
C.   55°
D.   60°
E.   90°

4. Which expression below makes the
    statement $3x + 5 \leq 5x - 3$ true?

F. $x \leq -2$
G. $x \geq -4$
H. $x \geq 2$
J. $x \leq 8$
K. $x \geq 4$

5. Jean bought a used car for $2,800 plus
    6% tax. How much more would she
    have paid for the car if the sales tax were
    7% instead of 6%?

A. $ 28
B. $ 56
C. $168
D. $196
E. $336

6. If $\tan x = \frac{3}{4}$, what is the value of

$\cos x + \sin x$?

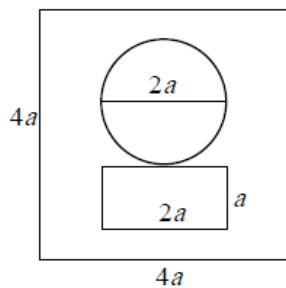F. $\frac{4}{3}$

G. $\frac{9}{16}$

H. $\frac{7}{5}$

J. $\frac{25}{12}$

K. 1

7. A square sheet of metal with sides $4a$ has
a circle of diameter $2a$ and a rectangle of
length $2a$ and width a removed from it.
What is the area of remaining metal?

A. $4a - 4\pi a^2 - 2a^2$
B. $14a^2 - \pi a^2$
C. $14a^2 - 4\pi a^2$
D. $4a^2 + \pi a^2 - a$
E. $4a^2 - 2\pi a^2$

8. Which of the following equations has a
graph that is a line perpendicular to the
graph of $x + 2y = 6$?

F. $2x - y = 3$
G. $2x + y = -3$
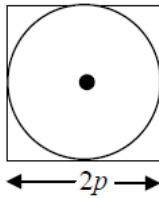H. $x - 2y = 3$
J. $y + x = 3$
K. $2y + x = -3$

9. If $x = ut + \frac{1}{2}at^2$, what is t when $x = 16$, $u = 0$, and $a = 4$?

   A. $2\sqrt{2}$
   B. $4\sqrt{2}$
   C. $\sqrt{2}$
   D. 2
   E. 4

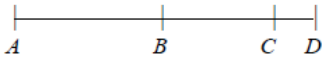10. If 18% of the senior class of 200 students were absent from school, how many students were present?

   F. 38
   G. 120
   H. 136
   J. 164
   K. 182

11. What is the area between the square and circle shown?

$\longleftarrow 2p \longrightarrow$

   A. $4p^2(1 - \pi)$
   B. $p^2(4 - 2\pi)$
   C. $4p^2(1 + \pi)$
   D. $p^2(4 - \pi)$
   E. $p^2(\pi - 4)$

12. The points A, B, C, and D divide the line segment AD in the ratio 4 : 3 : 1, respectively, and $AB = 24$ cm. What is the length of BD ?

   F. 12 cm
   G. 14 cm
   H. 18 cm
   J. 19 cm
   K. 24 cm

13. $\dfrac{2a-3}{2} - \dfrac{5a+3}{5} = ?$

    A.   -21

    B.   -9

    C. $-\dfrac{21}{10}$

    D. $-\dfrac{9}{10}$

    E. $\dfrac{9}{10}$

14. A plumber charges $35 flat fee plus $25 per hour. If his bill was $147.50, how many hours did the job take?

    F. $1\dfrac{1}{2}$

    G. $1\dfrac{3}{4}$

    H. $2\dfrac{1}{4}$

    J. $3\dfrac{1}{2}$

    K. $4\dfrac{1}{2}$

15. If $a = 1$, what is the value of $[(a+3)^2 - (a-3)^2]^2$?
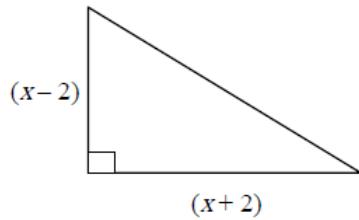
    A.   10
    B.   12
    C.   24
    D.   120
    E.   144

16. If the area of the triangle is 8, what is the value of x ?

$(x-2)$

$(x+2)$

    F. $5\sqrt{2}$
    G. $2\sqrt{5}$
    H. $4\sqrt{3}$
    J. $2\sqrt{3}$
    K. $3\sqrt{2}$

17. $2\sqrt{24} - 2\sqrt{2} \times \sqrt{3} = ?$

    A.   0
    B. $3\sqrt{24}$
    C.   -6
    D. $2\sqrt{6}$
    E. $4\sqrt{6}$

18. Vijay saves 20% on a $125 bowling ball but must pay 6% sales tax. What is the total he must pay?

    F. $ 94.00
    G. $100.00
    H. $106.00
    J. $107.50
    K. $205.00

19. The average (mean) temperature for five days was 2°. If the temperatures for the first four days were -10°, 30°, 0° and -5°, what was the temperature on the fifth day?

    A.   -10°
    B.   - 5°
    C.   0°
    D.   5°
    E.   20°

20. $\dfrac{2}{17} \div \dfrac{-4}{34} \div \dfrac{-1}{2} = ?$

    F.   2

    G. $\dfrac{1}{2}$

    H.   0

    J. $-\dfrac{1}{2}$

    K.   -2

21. If $(x + 2)^2 = (2^2)^3$ and $x > 0$, what is the value of x ?

    A.   2
    B.   3
    C.   4
    D.   6
    E.   -10

22. Solve $x^2 + 3x + 2 = 0$.

    F.   {-2, -3}
    G.   {-2, 3}
    H.   {-1, -2}
    J.   {-1, 2}
    K.   {1, 2}

23. Factor completely: $d^2 - 81 =$

    A. $(9 + d)(9 - d)$
    B. $(d - 9)(9 - d)$
    C. $(d + 9)(d - 9)$
    D. $(d + 9)(d + 9)$
    E. $d(9 - d)$

24. What is the equation of the line, in standard form, connecting points (2, -3) and (4, 4)?

    F. $7x - 2y - 26 = 0$
    G. $7x + y - 13 = 0$
    H. $7x - 2y - 20 = 0$
    J. $2x - 2y - 7 = 0$
    K. $3x - y + 10 = 0$

25. If quadrilateral $ABCD$ is a parallelogram with an area of 180 square units and a base of 20 units, what is its height?

    A.   9
    B.   5
    C.   4
    D. $3\frac{1}{2}$
    E. $1\frac{1}{4}$

26. $0.25 \div \left(\dfrac{1}{4} \div \dfrac{25}{100} \right) = ?$

    F. $\dfrac{1}{16}$
    G. $\dfrac{1}{4}$
    H.   1
    J.   4
    K.   16

27. If $x + y = 4$ and $2x - y = 5$, what is the value of $x + 2y$?

    A.   1
    B.   2
    C.   4
    D.   5
    E.   6

28. If $5x + 3y = 23$ and x and y are positive integers, which of the following can be equal to y ?

    F.   3
    G.   4
    H.   5
    J.   6
    K.   7

29. Which equation could be used to find the unknown, if $\frac{1}{2}$ less than $\frac{3}{5}$ of a number is the same as the number?

    A. $\frac{1}{2} - \frac{3}{5}x = \frac{1}{2}$

    B. $\frac{1}{2} - \frac{3}{5}x = x$

    C. $x - \frac{1}{2} = \frac{3}{5}x$

    D. $\frac{3}{5}x - \frac{1}{2} = x$

    E. $\frac{1}{2} - x = \frac{3}{5}x$

30. If $x*$ means $4(x - 2)^2$, what is the value of $(3*)*$?

    F.   8
    G.   12
    H.   16
    J.   36
    K.   None of the above

31. What is the vertex of the parabola $y = (x + 3)^2 - 6$?

    A.   (3, 6)
    B.   (-3, 6)
    C.   (3, -6)
    D.   (-3, -6)
    E.   None of the above
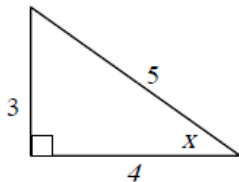
32. What is the slope of the line connecting
the points (2, -2) and (3, -2)?

    F.   undefined
    G.   1
    H.   0
    J.   -1
    K.   -4

33. Which of the following is not equal to
the other four?

    A. 1.1×10
    B.   110%
    C. $\sqrt{1.21}$
    D. $\dfrac{11}{10}$
    E. $1 + \dfrac{1}{10}$
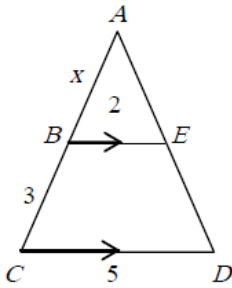
34. According to the diagram, which of the
following statements is true?

    F $\sin x = \dfrac{5}{3}$

    G. $\cos x = \dfrac{3}{5}$

    H. $\tan x = \dfrac{5}{4}$

    J. $\cos x = \dfrac{4}{5}$

    K. $\sin x = \dfrac{4}{5}$

35. If $\triangle ABE$ is similar to $\triangle ACD$, what is the value of AB ?

- A. $7\frac{1}{2}$
- B. 3
- C. 2
- D. $1\frac{1}{2}$
- E. -2

36. What is the probability of selecting the letter M or T, if from the letters M, A, T, H, E, M, A, T, I, C, S, a single letter is drawn randomly?

- F. $\frac{4}{11}$
- G. $\frac{3}{11}$
- H. $\frac{2}{11}$
- J. $\frac{1}{11}$
- K. 0

37. A salesman is paid \$150/week plus $x\%$ commission on all sales. If he had s dollars in sales, what was the amount of his paycheck (p)?

- A. $p = 150 + \dfrac{xs}{10}$
- B. $p = 150 + s$
- C. $p = 150 + 0.01xs$
- D. $p = 150 + xs$
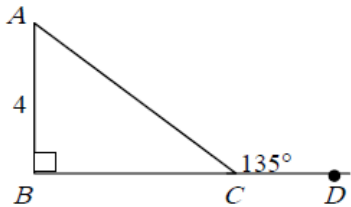- E. $p = 150 + 100xs$

38. If $2 + \dfrac{x}{(x-2)} = 4$, what is the value of

$-|x|$?

    F.   -4
    G.   -2
    H.   0
    J.   2
    K.   4

39. Which of the following lines is parallel to $2y = 3x - 1$?

    A. $y = \frac{1}{3}x - 1$
    B. $2y = x - 3$
    C. $4y = 6x + 8$
    D. $y = 3x + 4$
    E. $3y = 2x - 3$

40. Given $\triangle ABC$ with $AB = 4$ and $m \angle ACD = 135°$, what is the value of AC ?

    F.   4
    G. $4\sqrt{2}$
    H. $3\sqrt{2}$
    J.   8
    K.   5

41. If the diameter of a bicycle wheel is 50 centimeters, how many revolutions will the wheel make to cover a distance of 100π meters?

    A.   12
    B.   20
    C.   120
    D.   200
    E.   1200

42. If $x^* = x + 2$, what is the value of
    $(3^* + 5^*)^*$?

    F.   8
    G.   10
    H.   12
    J.   14
    K.   None of the above

43. If $\dfrac{15k}{3kx + 16} = 1$ and $x = 4$, what is the
    value of k?

    A.   2
    B.   3
    C.   4
    D.   8
    E. $\dfrac{16}{3}$

44. $-7 - 3 \times 2(-5) + 6 - 21 \div 3 = ?$

    F.   99
    G.   95
    H.   33
    J.   25
    K.   22

45. Simplify $\dfrac{3y}{10} + \dfrac{7y - 2}{5}$.

    A. $\dfrac{17y - 4}{10}$

    B. $\dfrac{10y - 2}{15}$

    C. $\dfrac{4y - 2}{10}$

    D. $\dfrac{85y - 2}{50}$

    E. $\dfrac{10y - 2}{5}$

46. Which of the following is equivalent to
$$\frac{\cos x}{\sin x} + \frac{\sin x}{\cos x}?$$

    F. $\dfrac{\cos x + \sin x}{\sin x \cos x}$

    G. $\dfrac{1}{\sin x \cos x}$

    H. $\tan x + \cos^2 x$

    J. $\sin x \cos x$

    K. $2 \sin x \cos x$

47. (-2, -3) is a solution to which inequality?

    A. $2y \geq 3x + 1$
    B. $-2y \leq -x + 3$
    C. $\dfrac{x}{2} \geq 4 - y$
    D. $y - 2 \geq (x - 3)$
    E. $x - y < 0$

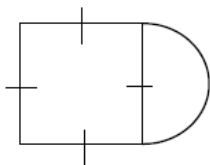48. What is the distance between the points (-3, 4) and (9, 9)?

    F.   5
    G. $5\sqrt{2}$
    H.   12
    J.   13
    K.   17

49. If the area of the semicircular region is 8π, what is the perimeter of the shape?

    A. $16 + 8\pi$
    B. $24 + 4\pi$
    C. $12 + 8\pi$
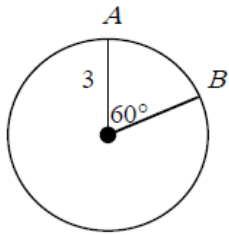   D. $24 + 4\pi^2$
    E. $16 + 4\pi^2$

50. If $f(x) = x^2 - 5$ and $g(x) = 5x$, what is the value of $f(g(3)) - g(f(3))$?

    F.   400
    G.   240
    H.   200
    J.   40
    K.   0

51. What is the length of arc AB ?

    A. π
    B. 2π
    C. 2.5π
    D. 3π
    E. 6π

52. If two sides of a triangle are 6 cm and 8 cm, which of these could be the third side?

    F.   1
    G.   2
    H.   7
    J.   14
    K.   15

53. If $x = 4$ is a solution of the equation $x^2 + kx - 24 = 0$, what is the value of k?

    A.   -6
    B.   -2
    C.   2
    D.   4
    E.   6

54. Which of the following is not a solution for $|5 - 2x| \geq 3$?

    F. -2
    G. -1
    H. 0
    J. 2
    K. 5

55. Which of the following forms an identity with $\dfrac{\tan x}{\sec x}$?

    A. $\sin x$

    B. $\dfrac{\sin x}{\cos^2 x}$

    C. $\dfrac{\sin^2 x}{\cos x}$

    D. $\cot x$

    E. $\dfrac{1}{\sin x}$

56. $\dfrac{7}{2 - \sqrt{3}} = ?$

    F. $14 + 7\sqrt{3}$
    G. $-7\sqrt{3}$
    H. $21\sqrt{3}$
    J. $\dfrac{14 - 7\sqrt{3}}{-5}$
    K. $14\sqrt{3} - 5$

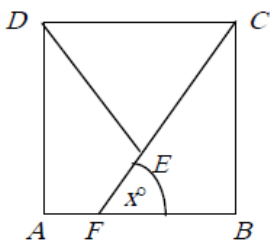57. Solve for x: $|x + 3| - 2 = 10$

    A. -9, 6
    B. -15, 16
    C. -8, 2
    D. -5, -3
    E. -15, 9

58. $8^{\frac{2}{3}} \cdot 2^{-1} = ?$

    F. $\dfrac{1}{16}$

    G. $\dfrac{1}{2}$

    H.   2

    J.   4

    K.   16

59. If $ABCD$ is a square and CDE is an equilateral triangle, what is the value of x?

    A.   30°

    B.   40°

    C.   45°

    D.   50°

    E.   60°

60. Solve for the variable: $7x + 9 = -2 - 4x$

    F.   -11

    G.   -1

    H.   1

    J.   6

    K.   11

END OF PRACTICE TEST B