

1) If  $x = \frac{5}{12}$  is the solution of the equation  $\frac{x}{5} + \frac{k}{4} = \frac{4x}{5} + \frac{3}{2}$ , then  $k =$

A) 7

B) -7

C)  $-\frac{1}{7}$

D)  $\frac{1}{7}$

E)  $\frac{7}{4}$

2) If the equation  $-2(3 + 4x) + 2(2x - 7) = ax + b$ , is an identity, then  $2a - b =$

A) 12

B) -24

C) -20

D) 44

E) 24

3) The length of a rectangle is 10 cm less than twice the width . If the perimeter of the the rectangle is 88 cm , then the length of the rectangle is:

A) 26 cm.

B) 18 cm.

C) 38 cm.

D) 28 cm.

E) 39 cm.

4) If the equation  $3x^2 + 2x = 5$  is written in the form  $(x - a)^2 = b$  , then  $a^2 + b =$

A)  $\frac{17}{9}$

B)  $\frac{16}{9}$

C)  $\frac{9}{16}$

D)  $\frac{1}{3}$

E)  $\frac{1}{9}$

5) If the quadratic equation  $2x^2 + kx + 2 = 0$  has two distinct nonreal complex solutions, then the values of  $k$  are in the interval :

- A)  $(-4, 4)$
- B)  $(0, 16)$
- C)  $(-16, 0)$
- D)  $(-16, 16)$
- E)  $(-\infty, -4) \cup (4, \infty)$

6) The solution set of the equation  $\sqrt[3]{x + \sqrt{x-2}} = \sqrt[3]{2}$ , consists of :

- A) one positive integer only.
- B) one negative integer only.
- C) two positive integers.
- D) one positive integer and one negative integer.
- E) two negative integers.

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- 7) The sum of all the solutions of the equation  $(2x - 1)^{\frac{2}{3}} + 2(2x - 1)^{\frac{1}{3}} = 3$  is :
- A) -12
- B) -10
- C) 8
- D) 14
- E) -13
- 8) The product of all the solutions of the equation  $x^3 + 27 = 0$  , is equal to :
- A) -27
- B) 25
- C) 9
- D) -9
- E) 12

9) Which one of the following statements is FALSE?

- A)  $(x + 4)^2 = x^2 + 16$  is an identity .
- B)  $x^2 = 9$  and  $x + 3 = 6$  are not equivalent equations.
- C)  $\frac{1}{2}(6x + 20) = x + 4 + 2(x + 3)$  is an identity .
- D)  $2(x - 8) = 3x - 16$  is a conditional equation.
- E)  $4(x + 7) = 2(x + 12) + 2(x + 1)$  is a contradiction.

10) The solution set , in interval notation , of the inequality  $\frac{4 - x^2}{x} \leq 3$  , is:

- A)  $[-4, 0) \cup [1, \infty)$
- B)  $(-\infty, 0) \cup [-3, 1]$
- C)  $(-\infty, 0] \cup [1, \infty)$
- D)  $[-4, -3] \cup [2, 5)$
- E)  $[-4, 0) \cup [3, \infty)$

- 11) The solution set , in interval notation , of the inequality  $x^2 + 4x + 6 \geq 3$  is :
- A)  $(-\infty, -3] \cup [-1, \infty)$
- B)  $(-\infty, 1] \cup [2, \infty)$
- C)  $[-3, -1]$
- D)  $[-1, \infty)$
- E)  $(-\infty, -3] \cup [2, \infty)$
- 12) The solution set, in interval notation , of the inequality  $|7 - 2x| - 1 < 3$  , is:
- A)  $(\frac{3}{2}, \frac{11}{2})$
- B)  $(\frac{3}{2}, 4)$
- C)  $(-\infty, \frac{3}{2}) \cup (\frac{11}{2}, \infty)$
- D)  $[4, \frac{11}{2}]$
- E)  $(-1, 1)$

13) If the points  $(0, -5)$  and  $(a, b)$  are the endpoints of a diameter of the circle with equation  $(x - 1)^2 + (y + 2)^2 = 10$ , then  $4a - 5b =$

A) 3

B) 5

C) 0

D) 4

E) - 5

14) If  $x < 0$ , then the distance between the points  $(4x, -5x)$  and  $(-2x, 3x)$  is:

A)  $-10x$

B)  $10x$

C)  $3\sqrt{6}x$

D)  $14x$

E)  $-14x$

15) If  $r$  and  $(h, k)$  are, respectively, the radius and the center of the circle  $x^2 + y^2 + 2x - 6y + 5 = 0$ , then  $r^2 + h + k =$

A) 7

B) 12

C) 0

D) 1

E) 8

16) If  $1 - \sqrt{2}$  and  $1 + \sqrt{2}$  are the solutions of the quadratic equation  $x^2 + bx + c = 0$ , then  $b + c =$

A) -3

B) 2

C) 1

D) -2

E) 0



17) The solution set , in interval notation , of the inequality  $(x - 1)(2x - 1) \geq (x - 1)(3x + 5)$  is :

- A)  $[-6, 1]$
- B)  $(-\infty, -6]$
- C)  $(-\infty, -6) \cup (1, \infty)$
- D)  $(-\infty, 1) \cup (6, \infty)$
- E)  $[-4, 1) \cup (1, \infty)$

18) The sum of all the solutions of the equation  $|2x + 8|^2 - |9x + 36| - 9 = 0$  is :

- A)  $-8$
- B)  $-1$
- C)  $-\frac{45}{4}$
- D)  $-7$
- E)  $-\frac{19}{4}$

19) The distance between the  $x$ -intercept of the graph of  $y = \sqrt{x - 3}$  and the point  $(-5, 2)$  is :

A)  $2\sqrt{17}$

B)  $2\sqrt{2}$

C)  $\sqrt{26}$

D)  $5\sqrt{2}$

E)  $\sqrt{6}$

20) The solution set of the equation  $\sqrt{2}x^2 + 5x - 3\sqrt{2} = 0$  , contains :

A) one positive and one negative irrational numbers.

B) only one positive rational number.

C) only one negative irrational number.

D) two positive irrational numbers.

E) one positive and one negative rational numbers.