Test #1 Review Math 1314

Name_____

MULTIPLE CHOICE. Choose the one alternative that best completes the statement or answers the question.

Solve.

1) $x^2 = 9$ 1) _____

A) $\pm\sqrt{3}$ B) ± 3 C) $\pm i\sqrt{3}$ D) $\pm 3i$

2) $x^2 = -27$ 2) _____

A) $\pm 3\sqrt{3}$ B) $\pm 9i\sqrt{3}$ C) $\pm 3i\sqrt{3}$ D) $\pm 9\sqrt{3}$

Solve the equation by the zero–factor property.

3) $2x^2 = -15x - 25$ 3) _____

A) $\left\{5, -\frac{5}{2}\right\}$ B) $\{-5, -10\}$ C) $\left\{5, \frac{5}{2}\right\}$ D) $\left\{-\frac{5}{2}, -5\right\}$

Use the square root property to solve the equation.

4) $(x + 9)^2 = 49$ 4) _____

A) $\{16, 2\}$ B) $\{-2\}$ C) $\{-16, -2\}$ D) $\{-58\}$

5) $(x - 4)^2 = 13$ 5) _____

A) $\left\{\sqrt{13} - 4, -\sqrt{13 - 4}\right\}$ B) $\left\{\sqrt{13} - \sqrt{-4}\right\}$

C) $\left\{4 + \sqrt{13}\right\}$ D) $\left\{4 \pm \sqrt{13}\right\}$

Solve the equation using the quadratic formula.

6) $6x^2 + 12x + 5 = 0$ 6) _____

A) $\left\{\frac{-6 \pm \sqrt{6}}{6}\right\}$ B) $\left\{\frac{-6 \pm \sqrt{66}}{6}\right\}$ C) $\left\{\frac{-12 \pm \sqrt{6}}{6}\right\}$ D) $\left\{\frac{-6 \pm \sqrt{6}}{12}\right\}$

7) $x^2 - 12x + 61 = 0$ 7) _____

A) $\{12 \pm 10i\}$ B) $\{11, 1\}$ C) $\{6 \pm 5i\}$ D) $\{-6 \pm 5i\}$

Solve the cubic equation.

8) $x^3 + 64 = 0$ 8) _____

A) $\{-4, 2 \pm 2i\sqrt{5}\}$ B) $\{-4, -2 \pm 2i\sqrt{6}\}$ C) $\{-4, -2 \pm 2i\}$ D) $\{-4, 2 \pm 2i\sqrt{3}\}$

Use the discriminant to determine the number of distinct solutions and whether they are rational, irrational, or nonreal complex.

9) $s^2 - 5s + 4 = 0$ 9) _____

A) One rational solution (a double solution)

B) Two distinct rational solutions

C) Two distinct irrational solutions

D) Two distinct nonreal complex solutions

10) $t^2 - 8t + 16 = 0$ 10) _____

A) One rational solution (a double solution)
B) Two distinct rational solutions
C) Two distinct irrational solutions
D) Two distinct nonreal complex solutions

11) $2y^2 = -3y - 3$ 11) _____

A) One rational solution (a double solution)
B) Two distinct rational solutions
C) Two distinct irrational solutions
D) Two distinct nonreal complex solutions

Find the values of a, b, and c for which the quadratic equation $ax^2 + bx + c = 0$ has these numbers as solutions:

12) 3i, −3i 12) _____

A) $x^2 - 9 = 0$ B) $x^2 + 6 + 9 = 0$ C) $x^2 - 6 - 9 = 0$ D) $x^2 + 9 = 0$

13) 2, −4 13) _____

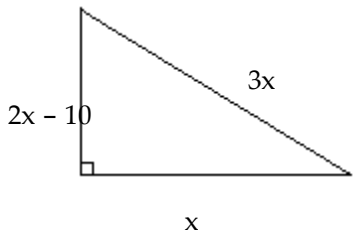
A) $x^2 + 2x - 8 = 0$ B) $x^2 - 8x - 2 = 0$ C) $x^2 - 8x + 2 = 0$ D) $x^2 - 2x - 8 = 0$

Answer the question.

14) If a rectangle is x feet long and y feet wide, which one of the following expressions is the length of its diagonal in terms of x and y? 14) _____

A) $\sqrt{x^2 + y^2}$ B) $\sqrt{x + y}$ C) $x + y$ D) $x^2 + y^2$

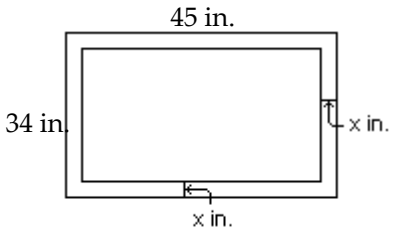
15) To solve for the lengths of the right triangle sides, which equation is correct? 15) _____



A) $x^2 = (3x)^2 + (2x - 10)^2$ B) $(2x - 10)^2 = x^2 + (3x)^2$

C) $x^2 + (3x)^2 = (2x - 10)^2$ D) $(2x - 10)^2 + x^2 = (3x)^2$

16) The mat around the picture shown measures x inches across. Which one of the following equations says that the area of the picture itself is 900 square inches? 16) _____



A) $2(45 - 2x) + 2(34 - 2x) = 900$
B) $(45 - x)(34 - x) = 900$
C) $(45 - 2x)(34 - 2x) = 900$
D) $(45)(34) - x^2 = 900$

Solve the problem.

17) The height of a box is 8 inches. The length is three inches more than the width. Find the width if the volume is 560. 17) _____
A) 8 in. B) 70 in. C) 7 in. D) 10 in.

18) A lot is in the shape of a right triangle. The shorter leg measures 180 m. The hypotenuse is 60 m longer than the length of the longer leg. How long is the longer leg? 18) _____
A) 180 m B) 240 m C) 360 m D) 300 m

19) A ball is dropped from a cliff that is 352 feet high. The distance S (in feet) that it falls in t seconds is given by the formula $S = 16t^2$. How many seconds (to tenths) will it take for the ball to hit the ground? 19) _____
A) 18.8 sec B) 7744 sec C) 4.7 sec D) 18.3 sec

Solve the equation.

20) $\frac{2}{x+9} + \frac{5}{x+2} = \frac{3}{x^2 + 11x + 18}$ 20) _____
A) $-\frac{46}{7}$ B) $-\frac{44}{5}$ C) -1 D) $\varnothing$

21) $\frac{4}{x-2} = 1 + \frac{6}{x+2}$ 21) _____
A) {4, −6} B) {−6, 6} C) {−4, 6} D) $\varnothing$

22) $\sqrt{2x + 15} - x = 6$ 22) _____
A) {−7, −3} B) {−7} C) {−3} D) $\varnothing$

23) $\sqrt{3x + 1} = 3 + \sqrt{x - 4}$ 23) _____
A) {−1} B) {−5, −8} C) {5, 8} D) $\varnothing$

24) $\sqrt[3]{4+6x} - \sqrt[3]{1-8x} = 0$ 24) _____

A) $\left\{-\frac{14}{3}\right\}$ B) $\left\{\frac{14}{3}\right\}$ C) $\left\{-\frac{3}{14}\right\}$ D) $\left\{\frac{3}{14}\right\}$

25) $\sqrt[4]{x+1} + 4 = 0$ 25) _____

A) $\{256\}$ B) $\{4\}$ C) $\{-256\}$ D) $\varnothing$

26) $(x+2)^{2/3} + 3(x+2)^{1/3} - 10 = 0$ 26) _____

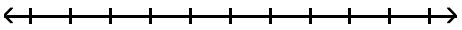
A) {127, 6} B) {−3, 4} C) {−127, 6} D) $\varnothing$

27) $36x^4 - 85x^2 + 49 = 0$ 27) _____

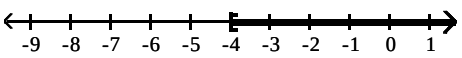
A) $\left\{1, \frac{7}{6}\right\}$ B) $\left\{-\frac{7}{6}, -1, 1, \frac{7}{6}\right\}$ C) $\left\{-1, -\frac{6}{7}\right\}$ D) $\left\{-1, -\frac{6}{7}, \frac{6}{7}, 1\right\}$

Solve and graph the inequality. Give answer in interval notation.

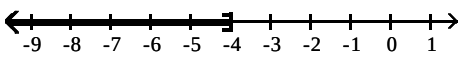
28) $-11x - 7 \le -12x - 11$ 28) _____



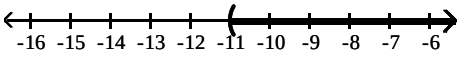
A) $[-4, \infty)$



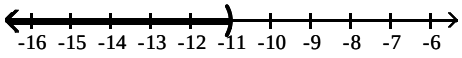
B) $(-\infty, -4]$



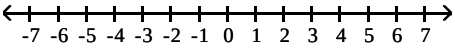
C) $(-11, \infty)$



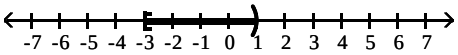
D) $(-\infty, -11)$



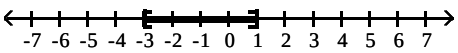
29) $-2 < 2x + 4 \le 6$ 29) _____



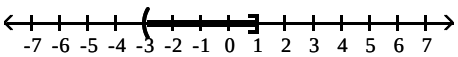
A) $[-3, 1)$



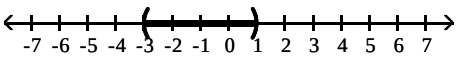
B) $[-3, 1]$



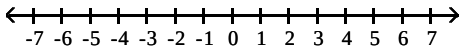
C) $(-3, 1]$



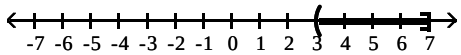
D) $(-3, 1)$



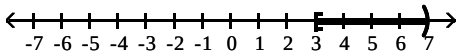
30) $19 < -5x + 4 \le 39$ 30) _____



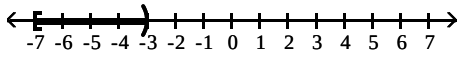
A) (3, 7]



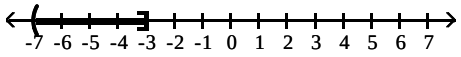
B) [3, 7)



C) [−7, −3)



D) (−7, −3]



Solve the quadratic inequality. Write the solution set in interval notation.

31) $x^2 - 4x - 21 \le 0$ 31) _____

A) [−3, 7]
B) [7, ∞)
C) (−∞, −3]
D) (−∞, −3] ∪ [7, ∞)

32) $x^2 - 11x + 28 \ge 0$ 32) _____

A) [7, ∞)
B) [4, 7]
C) (−∞, 4] ∪ [7, ∞)
D) (−∞, 4]

Solve the inequality. Write the solution set in interval notation.

33) $(5 - 2x)^2 \ge -16$ 33) _____

A) $\left(-\infty, \frac{9}{2}\right) \cup \left(\frac{1}{2}, \infty\right)$
B) $\left[\frac{9}{2}, \frac{1}{2}\right]$
C) (−∞, ∞)
D) ∅

34) $(2 - 5x)^2 \le -9$ 34) _____

A) $\left(-\infty, 1\right) \cup \left(-\frac{1}{5}, \infty\right)$
B) $\left[1, -\frac{1}{5}\right]$
C) (−∞, ∞)
D) ∅

Solve. Provide answers in interval notation.

35) $(x + 4)(x - 3)(x - 5) > 0$ 35) _____

A) (−∞, 3)
B) (5, ∞)
C) (−4, 3) ∪ (5, ∞)
D) (−∞, −4) ∪ (3, 5)

Solve the rational inequality. Write the solution set in interval notation.

36) $\frac{4x}{-5x + 18} \ge 10$ 36) _____

A) $\left(-\infty, 0\right] \cup \left(\frac{18}{5}, \infty\right)$
B) $\left[0, \frac{18}{5}\right)$
C) $\left(-\infty, \frac{10}{3}\right] \cup \left[\frac{10}{3}, \infty\right)$
D) $\left[\frac{10}{3}, \frac{18}{5}\right)$

37) $\frac{-4}{-6x - 5} > 0$ 37) _____

A) $\left(-\infty, \frac{5}{6}\right)$
B) $\left(-\frac{5}{6}, \infty\right)$
C) (0, ∞)
D) $\left(-\infty, -\frac{6}{5}\right)$

Solve the problem.

38) The profit made when t units are sold, $t > 0$, is given by $P = t^2 - 28t + 195$. Determine the number of units to be sold in order for $P = 0$ (the break–even point). 38) _____

A) $t = 13$ or $t = 15$ B) $t = -13$ or $t = -15$

C) $t = 28$ D) $t > 13$

39) The profit made when t units are sold, $t > 0$, is given by $P = t^2 - 29t + 198$. Determine the number of units to be sold in order for $P > 0$ (a profit is made). 39) _____

A) $18 < t < 11$ B) $t = 29$ C) $t = 18$ or $t = 11$ D) $t > 18$ or $t < 11$

40) The profit made when t units are sold, $t > 0$, is given by $P = t^2 - 27t + 176$. Determine the number of units to be sold in order for $P < 0$ (a loss is taken). 40) _____

A) $t > 0$ B) $t = 11$ or $t = 16$ C) $t < 11$ or $t > 16$ D) $11 < t < 16$

Solve the equation.

41) $|6x + 8| = 7$ 41) _____

A) $\left\{-\frac{1}{6}, -\frac{5}{2}\right\}$ B) $\left\{\frac{5}{2}, \frac{1}{6}\right\}$ C) $\left\{-\frac{1}{6}\right\}$ D) $\left\{-\frac{5}{2}, \frac{1}{6}\right\}$

42) $\left|\frac{5x - 4}{2x - 5}\right| = 3$ 42) _____

A) $\left\{\frac{7}{5}, \frac{1}{5}\right\}$ B) $\{-1, -10\}$ C) $\left\{11, \frac{19}{11}\right\}$ D) $\{19, 1\}$

43) $|3x + 4| = |10x + 7|$ 43) _____

A) $\left\{-\frac{3}{7}, -\frac{11}{13}\right\}$ B) $\left\{\frac{11}{7}, 1\right\}$ C) $\left\{-\frac{11}{7}, 1\right\}$ D) $\left\{\frac{3}{13}, \frac{11}{7}\right\}$

Solve the inequality. Write the solution set in interval notation.

44) $|x + 2| > 8$ 44) _____

A) $(-\infty, -10) \cup (6, \infty)$ B) $(6, \infty)$

C) $(-10, 6)$ D) $\emptyset$

45) $|7 - x| \le 8$ 45) _____

A) $[-1, \infty)$ B) $[-1, 15]$

C) $(-\infty, -1] \cup [15, \infty)$ D) $[15, \infty)$

Solve.

46) $|x - 4| = 0$ 46) _____

A) $(-\infty, 4)$ B) $\{4\}$ C) $(-4, \infty)$ D) $\{-4, 4\}$

47) $|6x - 2| = -4$ 47) _____

A) $\left\{1, \frac{1}{3}\right\}$ B) $\left\{-\frac{1}{3}\right\}$ C) $\left\{-\frac{2}{3}, -\frac{1}{3}\right\}$ D) $\emptyset$

48) $|x + 6| \geq 0$ 48) _____

A) $[-6, 6]$ B) $(-\infty, -6) \cup (-6, \infty)$

C) $(-\infty, \infty)$ D) $\emptyset$

49) $|x^2 + 4| = |4x|$ 49) _____

A) {2} B) {−2} C) {−2, 2} D) $\emptyset$

Solve the problem.

50) The temperatures on the surface of Mars in degrees Celsius roughly satisfy the inequality $|C + 81| \leq 52$. What range of temperatures corresponds to this inequality? 50) _____

A) [−133°C, 133°C] B) [−133°C, −29°C]

C) [−29°C, 29°C] D) [−29°C, 133°C]

1) B
2) C
3) D
4) C
5) D
6) A
7) C
8) D
9) B
10) A
11) D
12) D
13) A
14) A
15) D
16) C
17) C
18) B
19) C
20) A
21) A
22) C
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36) D
37) B
38) A
39) D
40) D
41) A
42) C
43) A
44) A
45) B
46) B
47) D
48) C

49) C
50) B