

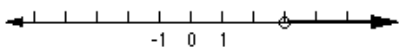
1. $\{a, b\}$ means
- A the set containing a and b
 - B a times b
 - C ordered pair a and b
 - D a is before b
 - E none of these
2. Set S is a subset of set T if
- A S is less than T
 - B T is less than S
 - C every member of T is a member of S
 - D every member of S is a member of T
 - E none of these
3. $\{ \}$ means
- A the set of all elements
 - B empty set
 - C not equal
 - D $\{0\}$
 - E none of these
4. The symbol to indicate “is an element of” is
- A \subset
 - B $=$
 - C \leq
 - D \in
 - E none of these
5. The notation $\{x \mid x \text{ is a whole number less than } 4\}$ means
- A x times x is less than 4
 - B x divided by x is a whole number less than 4
 - C the set of all x such that x is a whole number less than 4
 - D the set of all x
 - E none of these
6. Set builder notation to indicate the set of whole numbers greater than 7 is (it is agreed that x is a whole number)
- A $\{x \mid x > 7\}$
 - B $\{8, 9, 10, \dots\}$
 - C $\{x \mid 7 \text{ is a whole number}\}$
 - D $\{1, 2, 3, 4, 5, 6\}$
 - E none of these
7. Which of the following is a finite set?
- A $\{\text{whole numbers}\}$
 - B $\{\text{counting numbers}\}$
 - C $\{1, 2, 3\}$
 - D $\{0, 2, 4, \dots\}$
 - E none of these
8. Which of the following is an infinite set?
- A $\{\text{whole numbers}\}$
 - B $\{\text{counting numbers less than } 5\}$
 - C $\{1, 2, 3, \dots, 15\}$
 - D $\{\text{light bulbs in the world}\}$
 - E none of these
9. Sets are equal if
- A they have the same number of elements
 - B they have the same elements
 - C their elements are in the same order
 - D their elements have the same sum
 - E none of these
10. $\{a, b, c, d\} =$
- A $\{a, b, c, d, e\}$
 - B $\{a, c, b, d, e\}$
 - C $\{a, e, i, o\}$
 - D $\{1, 2, 3, 4\}$
 - E none of these

3

Expressions and Equations

11. Write the equation you would use to solve the problem: 20 less than Barbara's age is 50.
- A $20 - 50 = b$
 B $b + 50 = 20$
 C $b - 20 = 50$
 D $50 - b = 20$
 E $20 - b = 50$
12. Which equation would you use to solve the problem: 40 more than Joe's bowling score is 190. Find his score.
- A $40 - s = 190$
 B $s + 40 = 190$
 C $s - 190 = 40$
 D $s - 190 = 40$
 E $s = 190 + 40$
13. Solve: $-7t = -56$
- A $t = -9$
 B $t = 392$
 C $t = 8$
 D $t = -392$
 E $t = -8$
14. Solve: $-\frac{1}{3}y = 15$
- A $y = -5$
 B $y = 45$
 C $y = 5$
 D $y = 6$
 E $y = -45$
15. Solve: $x + 5x = -30$
- A $x = -6$
 B $x = -5$
 C $x = 6$
 D $x = -180$
 E $x = -150$
16. Solve: $-24 = -x + 7x$
- A $x = -3$
 B $x = -3$
 C $x = 4$
 D $x = -4$
 E $x = 3$
17. Which equation would you use to solve this problem: If 3% of 1600 people polled expressed no opinion, how many people expressed no opinion?
- A $0.03(1600) = N$
 B $3(1600) = N$
 C $0.03(N) = 1600$
 D $1600N = 3$
 E $\frac{1600}{N} = .03$
18. Which equation would you use to solve this problem: Karen saved \$8.00 on a coat that was reduced 20%. What was the original cost of the coat?
- A $8x = 20\%$
 B $0.2(8) = x$
 C $0.2x = 8$
 D $\frac{x}{8} = 20\%$
 E $\frac{0.2}{x} = 8$
19. Which equation would you use to solve this problem: At Linda's Cafe, Tom received \$31.50 in tips on customer's bills of \$210.00. What percent did his customers tip?
- A $31.50x = 210$
 B $210x = 31.50$
 C $\frac{x}{210} = 31.50$
 D $\frac{x}{31.50} = 210$
 E none of these

4 Inequalities

30.  is the graph of

- A $x \geq 2$
- B $x > 4$
- C $x \geq 3$
- D $x > 3$
- E none of these

31. Solve using inequalities: "The sum of a number and six is more than 4."

- A $x < -2$
- B $x > -2$
- C $x > 8$
- D $x < -8$
- E none of these

32. Solve using inequalities: "A number minus three is greater than 5."

- A $x < 3$
- B $x > 5$
- C $x < 8$
- D $x > 8$
- E none of these

33. Translate the word sentence into an inequality: "Three times a number is less than ten."

- A $3x + 10 < 0$
- B $3x > -10$
- C $3x < 10$
- D $3x - 10 = 0$
- E none of these

34. Translate the word sentence into an inequality: "Three times a number is more than ten."

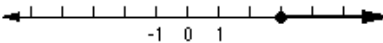
- A $3x + 10 < 0$
- B $3x < -10$
- C $3x > 10$
- D $3x - 10 = 0$
- E none of these

35. Solve $\frac{1}{2}x + 1 > 5$

- A $x > 2$
- B $x < -2$
- C $x > 8$
- D $x < -8$
- E none of these

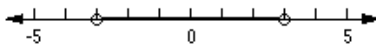
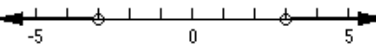
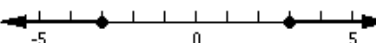
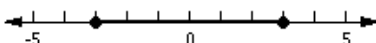
36. Solve $-2x - 2 > 2$

- A $x > 2$
- B $x > -2$
- C $x < 2$
- D $x < -2$
- E none of these

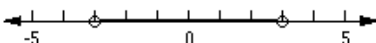
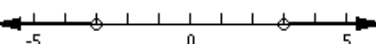
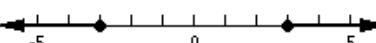
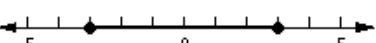
37. Which of the following simple sentences would graph as: 

- A $x < 3$
- B $x > -3$
- C $x \leq -3$
- D $x \geq 3$
- E $x \geq -3$

38. The graph of $|x| > 3$ is

- A 
- B 
- C 
- D 
- E none of these

39. The graph of $|x| \leq 3$ is

- A 
- B 
- C 
- D 
- E none of these

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Linear Equations

32. Write the equation $y = -3x + 2$ in standard form

- A $3x + y = 2$
- B $x + \frac{1}{3}y = -\frac{2}{3}$
- C $-3x - y = 6$
- D $-3x - y = 2$
- E none of these

33. Given the two points $(-1, 5)$ and $(2, -1)$, write the equation of the line

- A $y = -2x - 5$
- B $y = -2x + 3$
- C $y = 2x - 3$
- D $y = 2x + 5$
- E none of these

34. Given the two points $(3, -4)$ and $(-1, 2)$, write the equation of the line

- A $y = \frac{1}{2}x - \frac{3}{2}$
- B $y = -\frac{1}{2}x + \frac{3}{2}$
- C $y = -\frac{3}{2}x + \frac{1}{2}$
- D $y = \frac{3}{2}x - \frac{1}{2}$
- E none of these

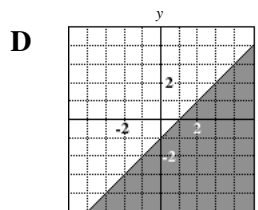
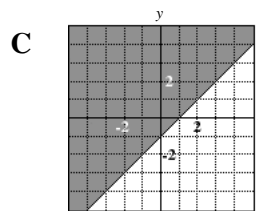
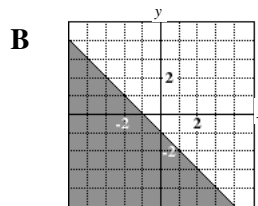
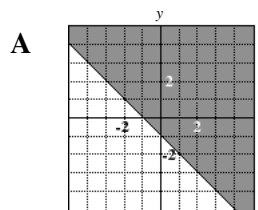
35. Find the slope as a percent if the vertical change is 3 feet for every 20 feet horizontal change

- A $\frac{3}{20}$
- B 15%
- C 6.67%
- D $\frac{20}{3}$
- E none of these

36. A railroad track rises 3.5 yards for each 70 yards it runs horizontally. What is the slope of the track as a percent?

- A 5%
- B $\frac{35}{70}$
- C $\frac{70}{35}$
- D 2%
- E none of these

37. Which of the following is the graph of $y \geq -x - 1$?



E none of these

$$26. \frac{-2x - 2}{2x^2 + 5x + 3} + \frac{3}{2x + 3} =$$

- A $\frac{1}{2x + 3}$
 B $\frac{x + 1}{2x^2 + 5x + 3}$
 C $\frac{x - 1}{2x^2 + 5x + 3}$
 D $\frac{-2x + 1}{2x^2 + 7x + 6}$
 E $\frac{1}{x + 1}$

$$27. \frac{2a - 1}{9a} + \frac{3a + 5}{4a} =$$

- A $19\frac{27}{36}$
 B $\frac{35a^2 + 41a}{36a}$
 C $\frac{5a + 4}{9a(4a)}$
 D $\frac{5a + 4}{13a}$
 E $\frac{35a + 41}{36a}$

$$28. \frac{u - 3}{u^2 - 9} - \frac{1}{u + 3} =$$

- A 0
 B $\frac{u - 4}{(u^2 - 9)(u + 3)}$
 C $\frac{(u - 3)(u + 3) - (u^2 - 9)}{(u^2 - 9)(u + 3)}$
 D $\frac{-6u}{(u^2 - 9)(u + 3)}$
 E none of these

$$29. \frac{7}{x^2 - x} - \frac{-4}{x - 1} =$$

- A $\frac{4x + 7}{x^2 - x}$
 B $\frac{11}{x^2 - 2x + 1}$
 C $\frac{4x^2 + 3x - 7}{x^2 - x}$
 D $\frac{11}{x}$
 E $\frac{11}{x^2 - 1}$

$$30. \text{Solve: } \frac{2t - 1}{t^2 - 9t + 20} = \frac{7}{t - 5} + \frac{4}{4 - t}$$

- A $t = 3\frac{2}{9}$
 B $t = 7$
 C $3t^2 - 13t + 28 = 0$
 D $t = 4$
 E none of these

$$31. \text{Solve: } \frac{3x - 1}{2x + 4} = \frac{4}{5}$$

- A $\frac{5}{6}$
 B 3
 C 5
 D $\frac{4}{5}$
 E none of these

32. A jet plane made a 3500 mile trip into a head wind in 7 hours. The return trip with a tail wind took only 5 hours. If the speed of the jet with no wind was 600 miles per hour, what was the wind speed?

- A 100 miles per hour
 B 50 miles per hour
 C 35 miles per hour
 D 200 miles per hour
 E 10 miles per hour

13 Quadratics

11. Arrange in standard form and identify the values of a , b , and c . $x^2 + 11 = -7x$
- A $a = 1, b = 11, c = 7$
 B $a = 1, b = 7, c = 11$
 C $a = 1, b = -11, c = 7$
 D $a = 1, b = -7, c = 11$
 E $a = -1, b = 11, c = 7$
12. Solve using the quadratic formula: $x^2 - 6x = 27$
- A $x = -9$ or $x = 3$
 B not real
 C $x = 9$ or $x = -3$
 D $x = 6$ or $x = -3$
 E $x = 3$ or $x = -6$
13. Solve using the quadratic formula: $a^2 = -3a - 49$
- A $a = -3$ or $a = -1$
 B not real
 C $a = 3$ or $a = -1$
 D $a = 4$ or $a = 1$
 E $a = -4$ or $a = 1$
14. Solve using the quadratic formula: $-2x = 15 - x^2$
- A not real
 B $x = 5$ or $x = -3$
 C $x = -2$ or $x = -5$
 D $x = 2$ or $x = 5$
 E $x = -5$ or $x = 3$
15. Solve using the quadratic formula: $a^2 = 4a - 4$
- A $a = 4$ or $a = 0$
 B $a = 2$
 C not real
 D $a = -4$ or $a = 0$
 E $a = -2$
16. Solve using the quadratic formula: $4x + 2 = -x^2$
- A not real
 B $x = -2 \pm \sqrt{2}$
 C $x = \frac{2 \pm \sqrt{2}}{2}$
 D $x = 2 \pm 4\sqrt{2}$
 E $x = \frac{-2 \pm \sqrt{2}}{2}$
17. Solve using the quadratic formula: $6 = -b^2 - 14b$
- A $b = -14 \pm 172$
 B $b = \frac{-14 \pm \sqrt{172}}{3}$
 C $b = 14 \pm \sqrt{172}$
 D not real
 E $b = -7 \pm \sqrt{43}$
18. Solve using the quadratic formula: $-x^2 = -3x + 8$
- A not real
 B $x = \frac{3 \pm \sqrt{41}}{2}$
 C $x = \frac{3 \pm \sqrt{23}}{2}$
 D $x = \frac{3 \pm 2\sqrt{3}}{2}$
 E $11 - \sqrt{10}$
19. Solve using the quadratic formula: $a^2 + 5 = 3a$
- A $a = \frac{3 \pm \sqrt{29}}{2}$
 B $a = \frac{3 \pm \sqrt{11}}{2}$
 C $a = \frac{-3 \pm \sqrt{11}}{2}$
 D $a = \frac{-3 \pm \sqrt{29}}{2}$
 E not real