

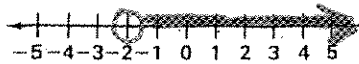
**ALGEBRA CONCEPTS
FINAL EXAM**

NAME KEY

Review

1. Graph the inequality.

$x > -2$

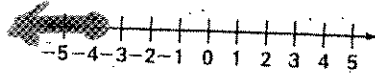


2. Solve the inequality and graph.

$x + 7 \leq 3$

$x + 7 \leq 3$
 $-7 \quad -7$

 $x \leq -4$



3. Solve the inequality.

$2x - 5 \geq 27$
 $+5 \quad +5$

 $2x \geq 32$
 $\frac{2x}{2} \geq \frac{32}{2}$
 $x \geq 16$

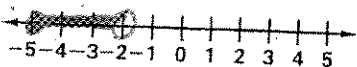
4. Solve the inequality.

You are at the music store to buy some CDs. You have \$40 to spend and the store sells CDs for \$6.99 each. Write an inequality that represents the number of CDs that you can buy without spending more money than you have.

$6.99x \leq 40$

5. Write an inequality that represents the statement and graph the inequality.

x is less than -2 and greater than or equal to -5

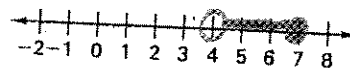


$-5 \leq x < -2$

6. Solve the inequality and graph its solution.

$-2 < x - 6 \leq 1$
 $+6 \quad +6 \quad +6$

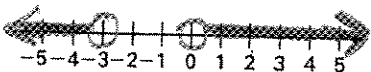
 $4 < x \leq 7$



7. Solve the inequality and graph its solution.

$x - 7 < -10$ or $x + 2 > 2$
 $+7 \quad +7$ $-2 \quad -2$

 $x < -3$ $x > 0$



8. Solve the equation.

$|x| = 7$

$x = 7$ or $x = -7$

9. Is the ordered pair a solution?

$x + y > -2$; (3, 0)

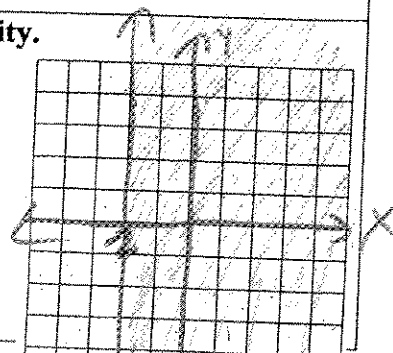
$3 + 0 > -2$

$3 > -2$

Yes

10. Graph the inequality.

$x \geq -2$



11. Check whether the ordered pair is a solution.

$$\begin{aligned}x + y &= 5 & (0, 5) \\ -5x + 2y &= 10\end{aligned}$$

$$\begin{aligned}0 + 5 &= 5 \checkmark \\ -5(0) + 2(5) &= 10 \checkmark\end{aligned}$$

YES

12. Check whether the ordered pair is a solution.

$$\begin{aligned}-x + 2y &= 5 \\ x - 3y &= 4 & (-2, 1)\end{aligned}$$

$$\begin{aligned}-(-2) + 2(1) &= 5 \quad \times \\ -2 - 3(1) &= 4 \quad \times\end{aligned}$$

NO

13. Solve.

You are selling tickets for a high school basketball game. Student tickets cost \$2 and adult tickets cost \$5. You sell 75 tickets and collect \$240. How many of each type of ticket did you sell?

$$\begin{aligned}x + y &= 75 \\ 2x + 5y &= 240\end{aligned}$$

45 student
30 adult

14. Solve the linear system.

$$\begin{aligned}x + y &= 7 \\ x - y &= 23\end{aligned}$$

$$(15, -8)$$

15. Solve the linear system.

$$\begin{aligned}x + y &= 8 \\ 2x + y &= 10\end{aligned}$$

$$(2, 6)$$

16. Solve.

A music store is selling CD's for \$9.50 and \$6.50. You buy 12 CDs and spend a total of \$87. How many CDs that cost \$9.50 did you buy?

$$\begin{aligned}x + y &= 12 \\ 9.5x + 6.5y &= 87\end{aligned}$$

3 for \$9.50

17. Tell how many solutions the system has.

$$\begin{aligned}-x - y &= 1 \\ x + 3y &= 17\end{aligned}$$

1 solution

18. Tell how many solutions the system has.

$$\begin{aligned}2x + 3y &= 8 \\ 2x + 3y &= 12\end{aligned}$$

No Solution

19. Simplify the expression.

$$3^5 \cdot 3^2$$

$$3^7 = 2,187$$

20. Simplify the expression.

$$(5x^3y)^2$$

$$25x^6y^2$$

21. Simplify the expression.

$$n^7 \cdot n^4$$

$$n^{11}$$

22. Complete the statement using < or >.

$$(4 \cdot 9)^4 \quad ? \quad 4 \cdot 9^4$$

>

23. Evaluate the expression.

$$6^{-4}$$

$$\frac{1}{1296}$$

24. Rewrite with positive exponents.

$$\frac{1}{4x^{-5}}$$

$$\frac{x^5}{4}$$

25. Evaluate the expression.

$$\frac{7^8}{7^5}$$

$$7^3 = 343$$

26. Rewrite the number in decimal form.

$$3.156 \times 10^{-5}$$

$$.00003156$$

27. Rewrite the number in scientific notation.

$$5,340,000$$

$$5.34 \times 10^6$$

28. In 1998, the population of a city was 100,000. Then for next five years, the population increased by 6%, what was the population in 2003?

$$C = 100,000 (1 + .06)^5$$
$$= 133,823$$

29. You buy a used truck for \$8,000. It depreciates at a rate of 14% per year. Find the value of the truck after 5 years.

$$C = 8,000 (1 - .14)^5$$
$$= 3763$$

30. Classify the model as exponential growth or decay.

$$y = 136(0.7)^x$$

Decay

31. Evaluate the expression.

$$\sqrt{144}$$

12

32. Evaluate the expression.

$$\sqrt{b^2 - 4ac} \text{ when } a = 8, b = 6, c = -2$$

$$\sqrt{6^2 - 4(8)(-2)}$$

$$= \sqrt{36 + 64} = \sqrt{100} = 10$$

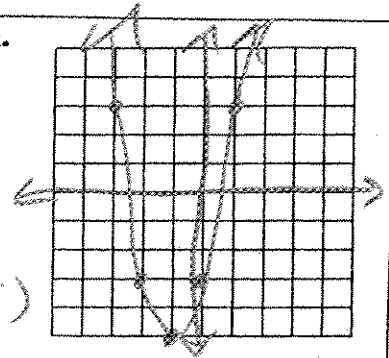
33. Solve the equation.

$$x^2 = 36$$

± 6

34. Sketch the graph.
Label the vertex.

$$y = 2x^2 + 4x - 3$$



vertex $(-1, -5)$

35. Simplify the expression. (No decimals)

$$\sqrt{24}$$

$2\sqrt{6}$

36. Simplify the expression. (No decimals)

$$\frac{\sqrt{4}}{\sqrt{49}}$$

$\frac{2}{7}$

37. Use the quadratic formula to solve the equation.

$$0 = x^2 + 6x - 16$$

$x = 2, x = -8$

38. Use the quadratic formula to solve the equation.

$$0 = x^2 - 6x + 8$$

$x = 2, x = 4$

39. Decide how many solutions the equation has.

$$x^2 - 6x + 9 = 0$$

1 solution

40. Decide how many solutions the equation has.

$$x^2 + 5 = 0$$

No solutions

41. Find the sum.

$$(2x^2 + 4x + 7) + (3x^2 - 2x - 6)$$

$$5x^2 + 2x + 1$$

42. Find the difference.

$$(5x^2 + 6x - 8) - (2x^2 - 2x + 3)$$

$$3x^2 + 8x - 11$$

43. Find the product.

$$(2x + 3)(3x - 6)$$

$$6x^2 - 3x - 18$$

44. Find the product.

$$(2x - 4)(x^2 - 2x + 3)$$

$$2x^3 - 8x^2 + 14x - 12$$

45. Solve the equation.

$$(x + 7)(x - 3) = 0$$

$$x = -7, x = 3$$

46. Factor.

$$2x^2 + 5x - 3$$

$$(x + 3)(2x - 1)$$

47. Factor.

$$x^2 + 12x + 32$$

$$(x + 4)(x + 8)$$

48. Factor.

$$x^2 - 49$$

$$(x + 7)(x - 7)$$

49. Factor then solve.

$$x^2 - 3x + 10 = 0$$

Does not factor \rightarrow

No solutions

(Quadratic Formula)

50. Factor then solve.

$$4x^2 + 7x + 3 = 0$$

$$(x + 1)(4x + 3) = 0$$

$$x + 1 = 0 \quad 4x + 3 = 0$$

$$x = -1 \quad x = -\frac{3}{4}$$

