

1. Write each expression in rational exponent form.

$$x^{\frac{e}{l}} = \sqrt[l]{x^e}$$

a. $\sqrt[3]{10} = 10^{\frac{1}{3}}$

b. $\sqrt[4]{d} = d^{\frac{1}{4}}$

2. Write each expression in radical form.

a. $11^{\frac{1}{2}} = \sqrt{11}$

b. $a^{\frac{1}{5}} = \sqrt[5]{a}$

3. Evaluate the expression $\sqrt[4]{625} = \sqrt[4]{\underbrace{5 \cdot 5 \cdot 5 \cdot 5}} = 5$
 1 group of 4 5's

What is the simplified form of each expression?

4. $(-3.2)^0 = 1$

5. $\frac{6c^{-3}t^3}{1} = \frac{6t^3}{c^3}$

6. $\frac{1}{a^{-5}} = a^5$

Exponents must be positive!

7. $\frac{6}{g^{-3}h} = \frac{6g^3}{h}$

8. $\frac{7x^{-8} \cdot 6x^3}{1} = \frac{42}{x^5}$

9. $x^8 \cdot 2y^{10} \cdot 5x^5 = 10x^{13}y^{10}$

10. $-4x^3 \cdot 2y^{-2} \cdot 5y^5 \cdot x^{-8} = -\frac{40y^3}{x^5}$

11. $(p^6)^2 = p^{12}$

12. $(3h^3)^4 = 3^4h^{12} = 81h^{12}$

13. $(-5g^4h^6)^2(g^5h^5)^5$
 $(25g^8h^{12})(g^{25}h^{25}) = 25g^{33}h^{37}$

14. $\frac{t^{11}}{t^2} = t^9$

15. $\frac{a^{-2}}{a^4} = \frac{1}{a^6}$

16. $\frac{g^7h^8}{g^{11}h^2} = \frac{h^6}{g^4}$

17. $\left(\frac{1}{2j^4}\right)^2 = \frac{1}{4j^8}$

18. $\left(\frac{6t^4}{5y^2}\right)^5 = \frac{6^5t^{20}}{5^5y^{10}}$
 $= \frac{7776t^{20}}{3125y^{10}}$

19. Write the function $f(x) = 2^x$ as a reflection over the y-axis.

$g(x) = 2^{-x}$ x-values change

20. Write the function $f(x) = 2^x$ as a reflection over the x-axis.

$g(x) = -2^x$ y-values change

Solve each system of equations by substitution.

21. $\begin{cases} y = 2x - 3 \\ x = 4 \end{cases}$

$y = 2(4) - 3$
 $= 8 - 3$
 $= 5 \quad (4, 5)$

22. $\begin{cases} 2x + y = 9 \\ y = 5x + 2 \end{cases}$

$2x + 5x + 2 = 9$
 $7x + 2 = 9$
 $7x = 7$
 $x = 1$

$y = 5(1) + 2$
 $y = 7$
 $(1, 7)$

Solve each system of equations using the linear combinations (elimination) method.

$$23. \begin{cases} 4x - y = 2 \rightarrow 8x - 2y = 4 \\ 2x + 2y = 26 + 2x + 2y = 26 \end{cases}$$

$$\begin{array}{r} 10x = 30 \\ x = 3 \end{array} \quad \begin{array}{r} 4(3) - y = 2 \\ 12 - y = 2 \\ 10 = y \end{array}$$

$(3, 10)$

$$24. \begin{cases} 3x + 5y = 8 \\ 2x - 5y = 22 \end{cases}$$

$$\begin{array}{r} 5x = 30 \\ x = 6 \end{array}$$

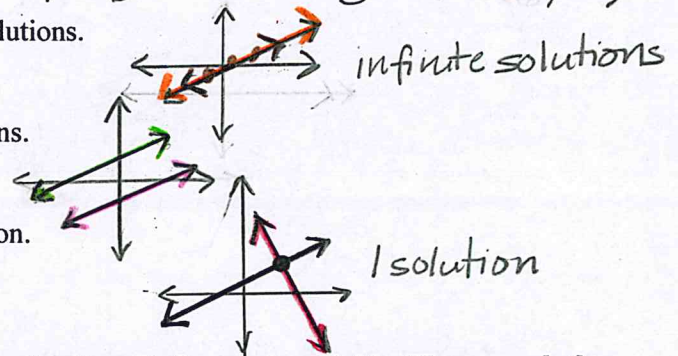
$$\begin{array}{r} 3(6) + 5y = 8 \\ 18 + 5y = 8 \\ 5y = -10 \\ y = -2 \end{array}$$

$(6, -2)$

25. Draw a graph of a system of linear equations with infinite solutions.

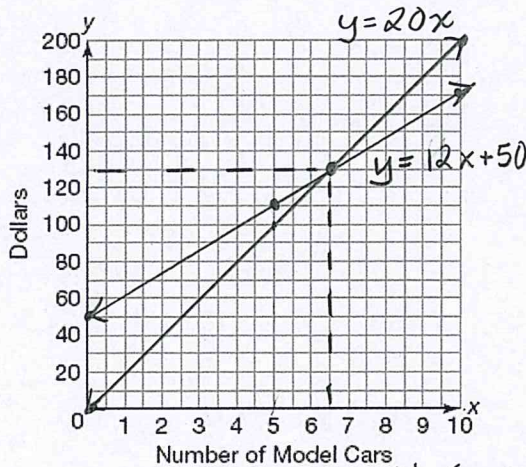
26. Draw a graph of a system of linear equations with no solutions.

27. Draw a graph of a system of linear equations with one solution.



Write a system of linear equations to represent each problem situation. Define each variable. Then, graph the system of equations and estimate the break-even point. Explain what the break-even point represents with respect to the given problem situation.

28. Eric sells model cars from a booth at a local flea market. He purchases each model car from a distributor for \$12, and the flea market charges him a booth fee of \$50. Eric sells each model car for \$20.



$x = \#$ of model cars
 $y =$ total cost/income
 Income: $y = 20x$
 Costs: $y = 12x + 50$

The breakeven point is when the cost of buying model cars = the income made from selling them. You need to sell 7 model cars before you break-even.

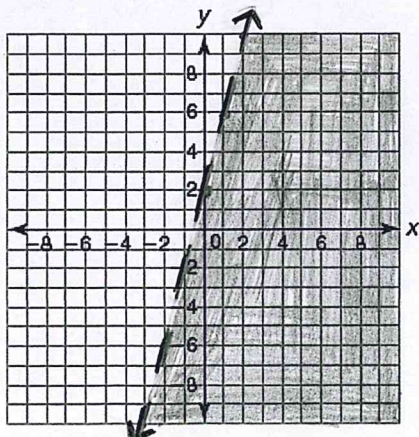
Break even pt $(6.5, 130)$

Tell whether the graph of each linear inequality will have a dashed line or a solid line. Explain your reasoning.

29. $x - 3y \leq 32$ solid line \leq or \geq means solutions can be on the line.
 Graph each linear inequality.

30. $y < 14x + 9$ dashed line, $<$ or $>$ means the solution is not on the line.

31. $y < 4x + 2$



32. $y \geq -x + 10$

