

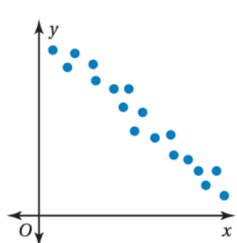
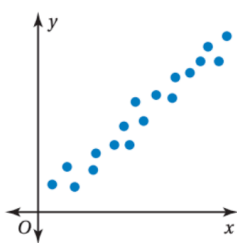
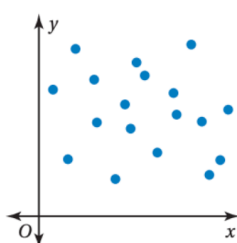
STUDY GUIDE

for quarterly assessment

Linear Regression

Correlation

Line of Best Fit



Calculate the linear regression

The table below shows the median ages of American women at their first marriage for selected years from 1960 through 2010. Calculate the line of best fit for the data.

| Number of years since 1960 | Median Age of American women at their first marriage |
|----------------------------|--|
| 0 | 20.3 |
| 5 | 20.6 |
| 10 | 20.8 |
| 15 | 21.1 |
| 20 | 22 |
| 25 | 23.3 |
| 30 | 23.9 |
| 35 | 24.5 |
| 40 | 25.1 |
| 45 | 25.3 |
| 50 | 26.1 |

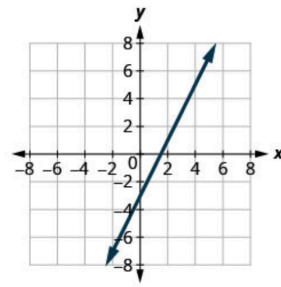
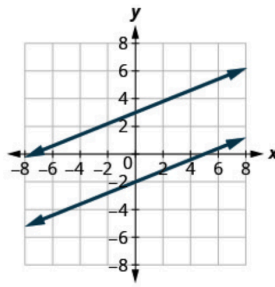
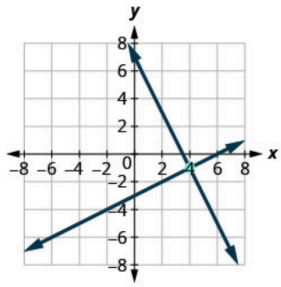
What does the point (20, 22) represent in this example?

RESIDUAL = Actual - Predicted

Calculate the residual for the year 1985.

Interpret the residual for 1985 given the context of this problem.

Solving Systems of Linear Equations



Solution

Solution is always a

Structure

How many solutions will you get?

$$2x + y = 7$$

$$x - 2y = 6$$

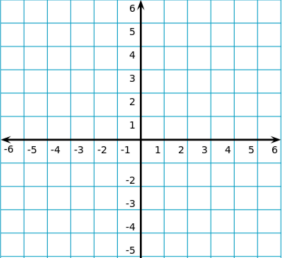
$$2x + y = 7$$

$$2x + y = 7$$

$$2x + y = 7$$

$$2x + y = 6$$

On the way to school you stop at Veronica's School Supply to pick up some writing utensils. You buy 2 boxes of pencils and 1 box of pens for \$4. Grayce, your best friend, buys 4 boxes of pencils and 4 boxes of pens for \$12. How much does it cost for a box of pencils? How much does it cost for a box of pens? Solve using all three methods.

| | |
|----------------------------|---|
| <p>SYSTEM</p> | <p>GRAPHING</p>  |
| <p>SUBSTITUTION</p> | <p>ELIMINATION</p> |

Solving Systems of Linear Inequalities

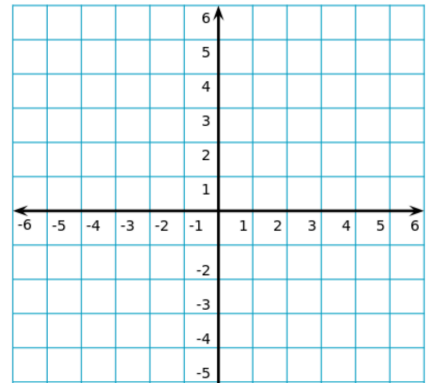
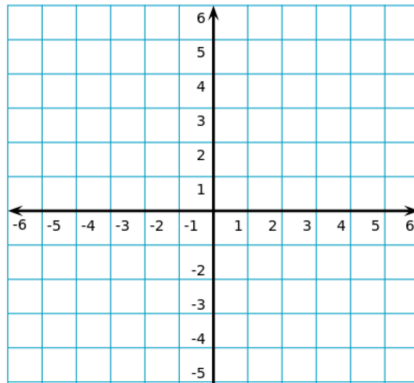
Inequality symbols

Shading

- The boundary line splits the graph into two parts.
- The inequality symbol tells you which part to shade.
- The solution is found in the shaded region.

$$y > 2x + 4$$

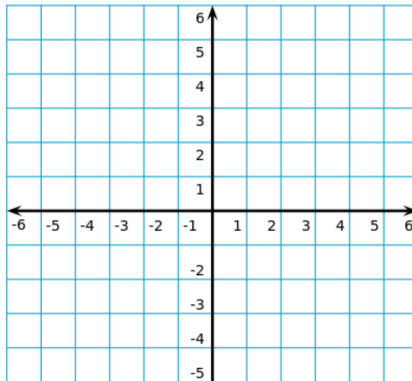
$$y \leq -\frac{3}{4}x - 2$$



Systems of Linear Inequalities

- Graph both lines on the same graph
- Shade solution region darkest.

$$3x - 6y < 12$$
$$y \geq 4x - 4$$



Sequences

Arithmetic or Geometric

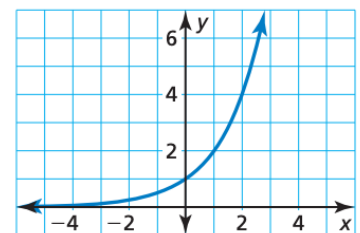
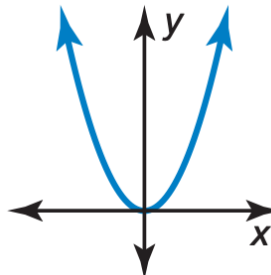
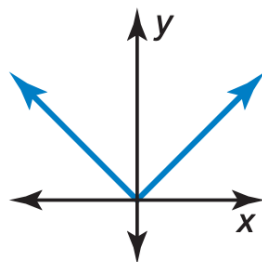
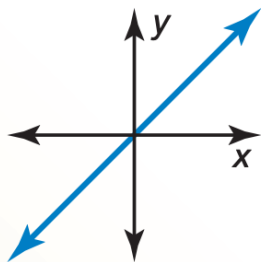
| | | | | |
|---|---|---|----|----|
| x | 1 | 2 | 3 | 4 |
| y | 4 | 8 | 12 | 16 |

| | | | | |
|---|---|---|----|----|
| x | 1 | 2 | 3 | 4 |
| y | 3 | 9 | 27 | 81 |

A scientist has discovered that a bacteria is growing in a fish tank and causing the fish to die off. On the first day, there were 1400 fish in the tank. On the second day, there were 700 fish in the tank. On the third day there were 350 fish in the tank. Write the explicit formula that depicts this scenario. Approximately how many fish will be in the tank after 7 days if the bacteria is not cleaned up?

Function Families

Identify the function family by the graph.



Exponents

Rules of exponents

$$x^5 \cdot x^3$$

$$\frac{x^8}{x^3}$$

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

$$x^0$$

$$\frac{x^{-3}}{x^6}$$

$$\frac{3x^2 y^{-4} z^3 \cdot 4x^{-3} z^8}{2x^5 y^{-2} z^7}$$

$$\left(\frac{2x^4 y}{3x^2}\right)^3$$

Solving Exponential Equations

When the bases are the same, set exponents equal

$$4^{2x-13} = 64$$

$$5^{-4x-8} = 625$$

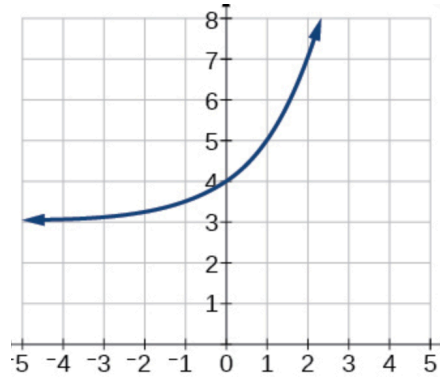
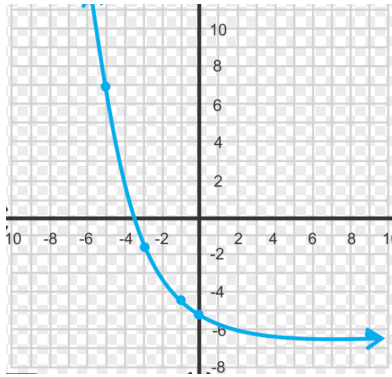
Characteristics of Exponential Functions

Growth or decay? What is the rate?

$$f(x) = 2600(.83)^t$$

$$f(x) = 12(1.89)^t$$

Are the following functions increasing or decreasing? What is the equation of the asymptote?



Transformation of Exponential Functions

$$y = a \cdot b^{(x-h)} + k$$

Describe the transformation from $f(x)$ to $g(x)$.

$$f(x) = 5^x$$

$$g(x) = 5^{(x+3)} - 2$$

$$f(x) = 17^x$$

$$g(x) = 17^{(x-5)} + 20$$