Key

Rearranging Formulas

Solve each equation.
Justify each step with a property of equality.

1) $3x + 2 = 14$

$\ -2\quad -2 \qquad$ Subtraction Poe

$\dfrac{3x}{3} = \dfrac{12}{3}$

$x = 4 \qquad$ division poe

2) $\frac{5x+y}{2} = 25$ Solve for y.

$5x + y = 50 \qquad$ ~~sub~~ Multiplication poe

$y = 50 - 5x \qquad$ subtraction poe

3) $\frac{4}{3}x - 16y = 21$ Solve for x.

$\frac{3}{4}\left[\frac{4}{3}x = 21 + 16y\right] \quad$ addition poe

$x = 12y + \frac{63}{4} \qquad$ multiplication poe

4) $\frac{4abc}{2} = 10$ Solve for a.

$4abc = 20 \qquad$ multiplication poe

$a = \frac{20}{4bc} \qquad$ division poe

$\boxed{a = \frac{5}{bc}}$

Rearranging Formulas

The volume V of a sphere of radius r is given by

$$V = \frac{4}{3}\pi r^3$$

5a. Solve for r in terms of V (get r alone).

$$\sqrt[3]{\frac{\frac{3}{4}V}{\pi}} = r$$

b. If Dulce knows the volume of a basketball is 455.9 cubic inches, what is the radius of the basketball?

$$\sqrt[3]{\frac{3V}{4\pi}} = \sqrt[3]{\frac{3(455.9)}{4\pi}} = \approx 4.77 \text{ in}$$

6a. The volume V of a cone of radius r and height h is given by

$$V = \frac{1}{3}\pi r^2 h$$

Solve for h in terms of V and r (get h alone).

$$\frac{3V}{\pi r^2} = h$$

b. If the Volume of a cone is 615.44 cubic feet and the radius 7 feet, what is the height of the cone?

$$\frac{3(615.44)}{\pi(49)} = h \qquad\qquad h \approx 12 \text{ ft}$$

c. Solve for r in terms of V and h.

$$\sqrt{\frac{3V}{\pi h}} = r$$

d. If the Volume of a cone is 1205.76 cubic yards and the height 18 yards, what is the radius of the cone?

$$\sqrt{\frac{3(1205.76)}{\pi(18)}} = r \qquad\qquad r \approx 8 \text{ yards}$$

Yvonne is researching cell phone plans. She included the information she gathered below in the following graph, table, and description. Each plan is based on how many gigabytes you use in a month. For comparison, she is only looking at the charge for one month.

Company B offers unlimited data for $75.

Company A's Plan	
Gigabytes Used	Charge
0 GB	$0
1 GB	$12.50
2 GB	$25
3 GB	$37.50
4 GB	$50
5 GB	$62.50
6 GB	$75
7 GB	$87.50
8 GB	$100
9 GB	$112.50
10 GB	$125
11 GB	$137.50
12 GB	$150
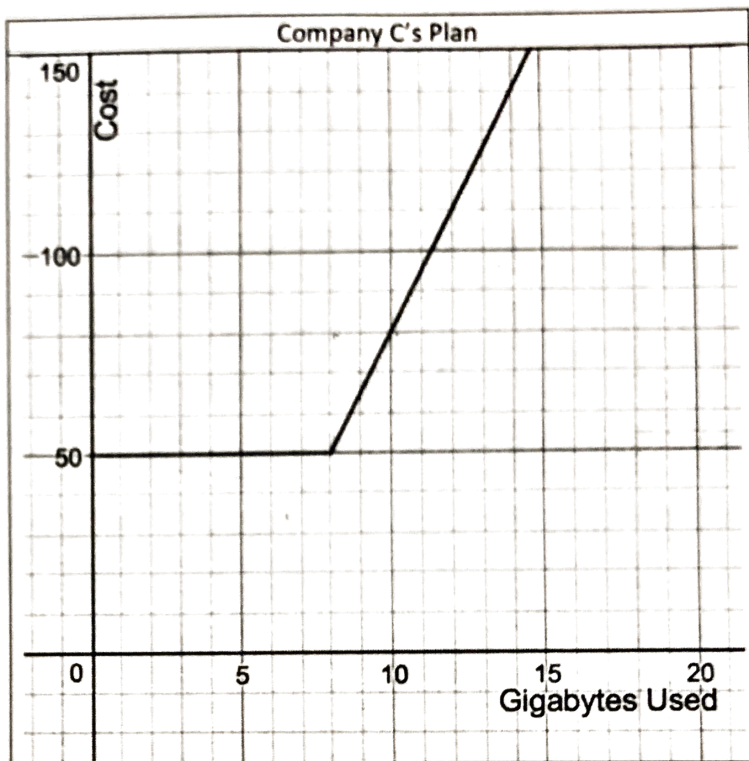
Company C's Plan

1. What is the linear function for Company A's plan? Explain what the slope means.

$$f(x) = 12.50x$$

2. What is the function for Company B's plan?
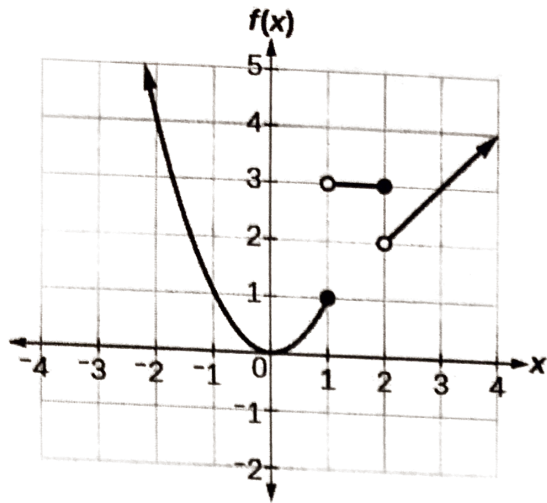
$$f(x) = 75$$

$$y = 15x + b$$

3. What is the piecewise function for Company C's plan?

$$f(x) = \begin{cases} 50 & 0 \le x \le 8 \\ 15x - 70 & x \ge 8 \end{cases}$$

4. When is Company B's plan the cheapest plan?

5. The average consumer uses 2 GB of data per month. Which plan should they use and why?

6. Write the piecewise function that matches the graph.

Solve each equation for the given variable.

1) IR = V (solve for R)

2) $\frac{2x+1}{5} = 3y$ (solve for x)

3) $W = \frac{A}{L}$ (solve for A)

4) ax + c = R (solve for x)

5) 2h = x − 3p (solve for p)

6) $F = \frac{GMm}{r^2}$ (solve for G)