

Name Solution**Instructions:** Show your work on each problem. Each problem is worth 4 points.

1. Simplify the following expression:

$$\frac{x^5 y^{-4}}{(y^{-3} x^2)^2} \cdot (x y^{-3})^2 = \frac{x^5 y^{-4} x^2 y^{-6}}{y^{-6} x^4} = \frac{x^7 y^{-10}}{x^4 y^{-6}} = x^3 y^{-4}$$

Answer $\frac{x^3}{y^4}$

2. Solve for t in the following:

$$\frac{3-2t}{7} = \frac{t}{3} \Rightarrow 9-6t = 7t$$

$$13t = 9 \Rightarrow t = \frac{9}{13}$$

Answer $\frac{9}{13}$

3. Suppose that you are planning a trip to Brazil.

At a Brazilian grocery store, the price of milk is 2.35 reais per liter. What is the price in US dollars per gallon? (1 dollar is 2.38 reais, 1 liter is 0.264 gallons)

$$\frac{2.35 \text{ r}}{1 \text{ L}} \cdot \frac{\$1}{2.38 \text{ r}} \cdot \frac{1 \text{ L}}{0.264 \text{ gal}} = \frac{\$3.74}{1 \text{ gal}}$$

Answer 3.74

4. **Working with Percentages:** Read the sentence below carefully and then answer the related question. Show your work.

78% of the people surveyed said that they have an internet connection in their home, and out of those, 85% said that they also have a cell phone. What percentage of surveyed people have both, an internet connection and a cell phone?

$$78\% \cdot 0.85 = 66.3\%$$

Answer 66.3%

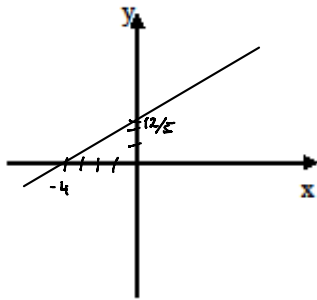
5. Suppose that \$4,500 is deposited in a bank account having 2.35% annual interest, compounded yearly. What will the balance of the account be twenty years from now assuming no withdrawals and no further deposits are made?

$$A = P(1 + APR)^y = \$4,500(1 + 0.0235)^{20} = \$7,160.93$$

Answer \$7,160.93

6. Graph the line $3x - 5y = -12$. Find the slope of the line, and the x and y intercepts.

Graph:



$$5y = 3x + 12 \Rightarrow y = \frac{3}{5}x + \frac{12}{5}$$

\downarrow $m = \frac{3}{5}$, $y\text{-int.} = (0, \frac{12}{5})$
 $0 = 3x + 12$
 $x = -4 \Rightarrow x\text{-int.} = (-4, 0)$

slope $\frac{3}{5}$

x-intercept $(-4, 0)$

y-intercept $(0, \frac{12}{5})$

7. The shape below with the given dimensions is a storage tank. The model will be scaled down so that the new model will have a height of 4 ft. Find the surface area and the volume of the new model.

scale factor = $\frac{4 \text{ ft}}{20 \text{ ft}} = \frac{1}{5} = 0.2$.

$SA_{\text{new}} = 0.2^2 \cdot 1,082.7 \text{ ft}^2$	NEW:	→	<u>43.3 ft²</u>
$V_{\text{new}} = 0.2^3 \cdot 2,655.7 \text{ ft}^3$		→	<u>21.2 ft³</u>

height = 20 ft
 surface area = 1,082.7 ft²
 volume = 2,655.7 ft³