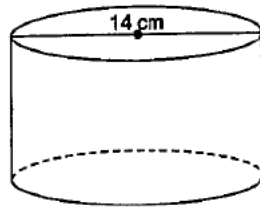


Collection of Word Problems over the Years

How High Is It?

The cylinder pictured below has a surface area of 660 cm^2 .



Use the following formula to determine the height of the cylinder:

$$\text{Surface area} = 2\pi r^2 + 2\pi rh$$

Show your work.

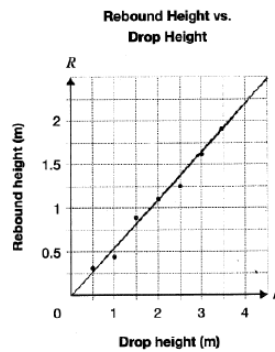
$$\begin{aligned} 660 &= 2\pi(7)^2 + 2\pi(7)h \\ 660 &= 307.88 + 43.98h \\ 660 - 307.88 &= 43.98h \\ \frac{352.12}{43.98} &= \frac{43.98h}{43.98} \end{aligned}$$

\therefore The height is 8

$$8 = h$$

Follow the Bouncing Ball

This scatter plot shows the relationship between the rebound height of a ball and the height from which the ball is dropped.



Draw a line of best fit for the data on the grid above.

Determine an equation for your line of best fit.

Show your work.

$$\begin{aligned} \text{slope} &= \frac{\text{rise}}{\text{run}} \quad y\text{-intercept} = 0 \\ &= \frac{0.5}{1} \\ &= 0.5 \quad \text{rebound height} \end{aligned} \quad R = \frac{1}{2}d$$

Equation of line of best fit: $R = \frac{1}{2}d$

Collection of Word Problems over the Years

Getting Paid

Hannah's total pay includes a base salary and a percent of her sales.
The following table shows her total pay for three different sales levels.

Sales (\$)	Total pay (\$)
15 000	1700
17 500	1825
28 000	2350

Determine Hannah's total pay when her sales are \$47 000.

Show your work.

As there is a rate, this can be found using line equations.

Find the slope:

(15 000, 1700)
(17 500, 1825)

$$m = \frac{y_1 - y_2}{x_1 - x_2}$$

$$= \frac{1825 - 1700}{17500 - 15000}$$

$$= \frac{125}{2500}$$

$$= \frac{125}{2500} = \frac{125 \div 125}{2500 \div 125} = \frac{1}{20} \text{ or } 20$$

$$y = mx + b$$

$$y = 20x + b$$

Let x represent 15000
Let y represent 1700

$$1700 = 20(15000) + b$$

$$1700 = 300,000 + b$$

$$1700 - 300,000 = b$$

$$-298,300 = b$$

$$y = 20(47,000) - 298,300$$

$$y = 940,000 - 298,300$$

$$y = 641,700$$

The slope is $y = 20x - 298,300$

How Many Uniforms?

The equation $C = 20n + 35$ represents the relationship between the cost of school volleyball uniforms, C , in dollars, and the number of uniforms ordered, n .

- The uniform company requires that the school order a minimum of 15 uniforms.
- The school has a maximum of \$600 to spend on the uniforms.

Determine the possible values for n and C in this situation.

Show your work.

The possible values for n are 15 - 28.

Minimum = 15 uniforms

Maximum = \$600

$$C = 20n + 35$$

$$600 = 20n + 35$$

$$565 = 20n$$

$$28.25 = n$$

The maximum number of uniforms the school can order under their budget is 28. (The 0.25 is left out because you can't order 0.25 of an uniform.)

The possible values for C are \$335 - \$600.

Minimum = 15 uniforms

$$C = 20n + 35$$

$$C = 20(15) + 35$$

$$C = 300 + 35$$

$$C = 335$$

Maximum = \$600

Collection of Word Problems over the Years

Know Your Lines

Consider the equations of the two lines below.

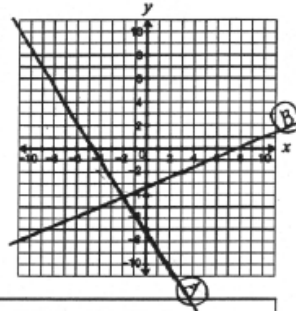
Line A: $y = -\frac{3}{2}x - 7$

Line B: $y = \frac{2}{3}x - 4$

Compare Line A and Line B. You may use the grid if you wish.

Justify your answers.

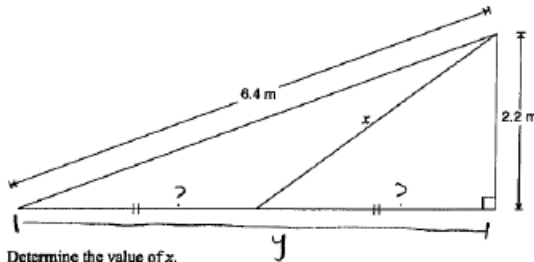
Complete the table below.



Characteristic	Comparison of Line A and Line B, with justification
Direction from left to right	A: slopes downward from left to right. B: slopes upward from left to right. Line A is negative $\downarrow y = -\frac{3}{2}x - 7$ negative slope. Line B is positive $\uparrow y = \frac{2}{3}x - 4$ positive slope.
Steepness	A: Very Steep B: Less steep than Line A. Line A is steeper $\rightarrow \frac{3}{2} \rightarrow$ higher rise than run. Line B is less steep $\rightarrow \frac{2}{3} \rightarrow$ lower rise than run.
Parallel, perpendicular or neither	Lines A and B are perpendicular. Slopes of: \rightarrow Line A: $-\frac{3}{2}$ \rightarrow Line B: $\frac{2}{3}$ negative reciprocals. \uparrow They intersect!

All the Right Stuff

The diagram below shows a small right triangle inside a large right triangle.



Determine the value of x .

Show your work.

$$y = \sqrt{6.4^2 - 2.2^2}$$

$$y = \sqrt{40.96 - 4.84}$$

$$y = \sqrt{36.12}$$

$$y = 6 \text{ m}$$

$$? = 6 \div 2$$

$$? = 3$$

$$x = \sqrt{2.2^2 + 3^2}$$

$$x = \sqrt{4.84 + 9}$$

$$x = \sqrt{13.84}$$

$$x = 3.72 \text{ m.}$$

Ans. The value of x is 3.72 m.