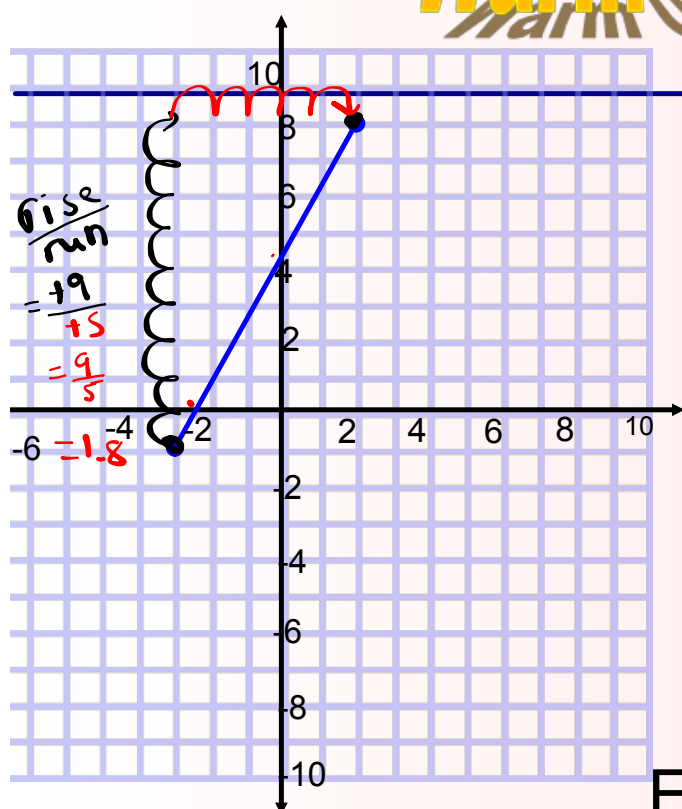


Warm Up



State the :

Domain: $\{x | -2 \leq x \leq 2, x \in \mathbb{R}\}$

Range: $\{y | -1 \leq y \leq 8, y \in \mathbb{R}\}$

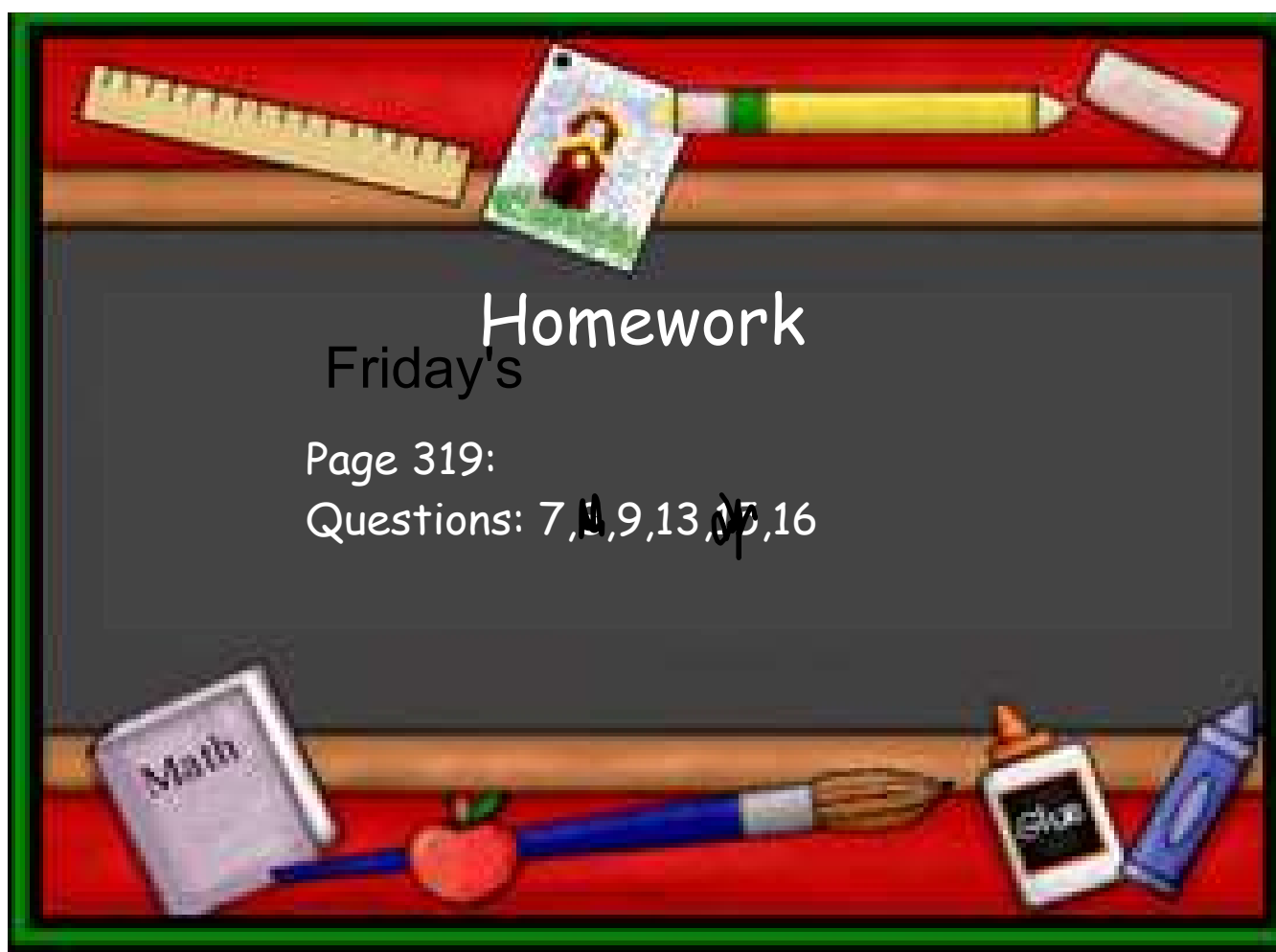
Function/Nonfunction:

x Intercept = -1.8

y Intercept = 4.1

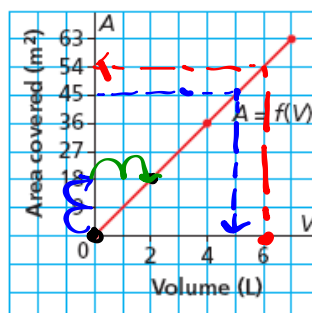
Rate of change =

Equation:



7. This graph shows the area, A square metres, that paint covers as a function of its volume, V litres.

- What is the rate of change? What does it represent?
- What area is covered by 6 L of paint?
- What volume of paint would cover 45 m^2 ?



$$\text{Rate: } \frac{\text{rise}}{\text{run}}$$

$$= \frac{+18 \text{ m}^2}{2 \text{ L}}$$

$$= 9 \text{ m}^2/\text{L}$$

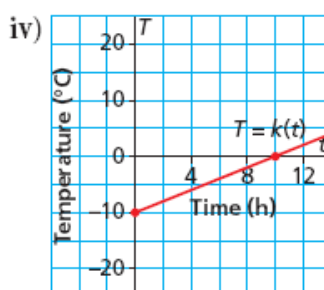
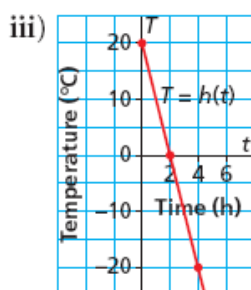
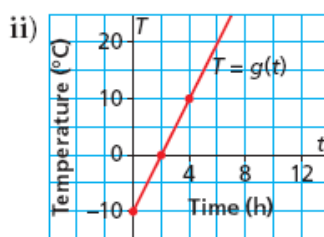
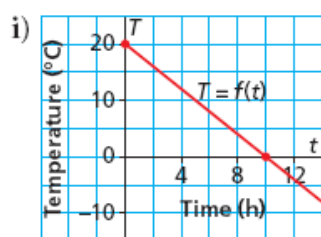
9 m^2 is covered
by 1 L of paint

$$\frac{9 \text{ m}^2}{1 \text{ L}} \times 6 = \frac{54 \text{ m}^2}{6 \text{ L}}$$

$$\frac{9 \text{ m}^2}{1 \text{ L}} = \frac{45 \text{ m}^2}{5 \text{ L}}$$

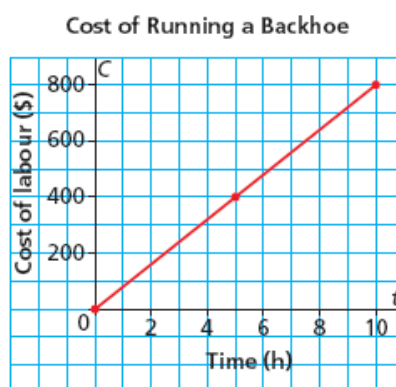
8. The graphs below show the temperature, T degrees Celsius, as a function of time, t hours, at different locations.

- a) Which graph has a rate of change of $5^{\circ}\text{C}/\text{h}$ and a vertical intercept of -10°C ?
- b) Which graph has a rate of change of $-10^{\circ}\text{C}/\text{h}$ and a vertical intercept of 20°C ?



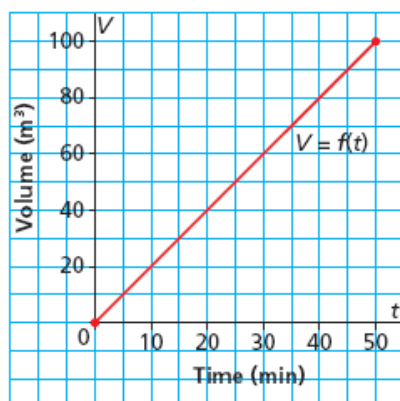
9. St. Adolphe, Manitoba, is located in the flood plain of the Red River. To help prevent flooding, backhoes were used to build dikes around houses and farms in the town. This graph shows the labour costs for running a backhoe.

- Determine the vertical and horizontal intercepts. Write the coordinates of the point where the graph intersects the axes. Describe what the point represents.
- Determine the rate of change.
What does it represent?
- Write the domain and range.
- What is the cost to run the backhoe for 7 h?
- For how many hours is the backhoe run when the cost is \$360?

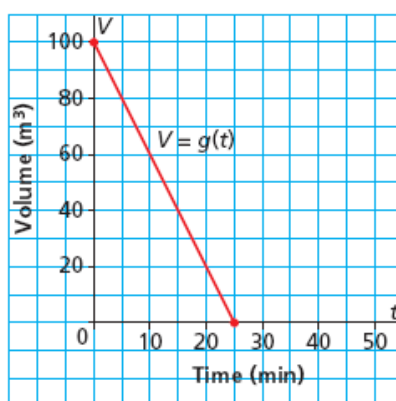


13. The capacity of each of 2 fuel storage tanks is 100 m^3 . Graph A represents the volume of fuel in one tank as a function of time as the tank is filled. Graph B represents the volume of fuel in another tank as a function of time as the tank is emptied.

Graph A



Graph B



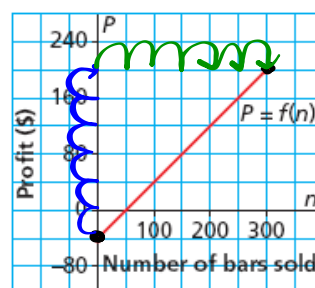
- a) Does it take longer to fill the empty tank or empty the full tank?
How do you know?
- b) In the time it takes for one tank to be half empty, about how much fuel would be in a tank that was being filled from empty?

15. Sketch a graph of each linear function for positive values of the independent variable.

a) $f(x) = 5 - 2.5x$ b) $g(t) = 85t$
c) $h(n) = 750 + 55n$ d) $V(d) = 55 - 0.08d$



16. Northlands School Outdoor Club had a fundraiser to help purchase snowshoes. The club had 300 power bars to sell. This graph shows the profit made from selling power bars.



- a) What is the profit on each bar sold? How do you know? *Rate of change*
 b) Determine the intercepts. What does each represent?
 c) Describe the domain and range for the function. Why would you not want to list all the values in the range?

a) $\frac{\$240}{300 \text{ bars}} = \$0.80/\text{bar}$

b) $x\text{-intercept} = 50$ *break even*
 $y\text{-intercept} = -40 \rightarrow$ cost to start business or cost for initial buying of bars

$\{x \mid 0 \leq x \leq 300, x \in \mathbb{R}\}$
 $\{y \mid -40 \leq y \leq 240, y \in \mathbb{R}\}$
 Includes all decimals

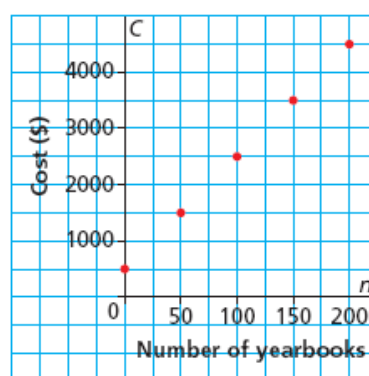
Example 4 Solving a Problem Involving a Linear Function

This graph shows the cost of publishing a school yearbook for Collège Louis-Riel in Winnipeg.

The budget for publishing costs is \$4200. What is the maximum number of books that can be printed?

 **SOLUTION**

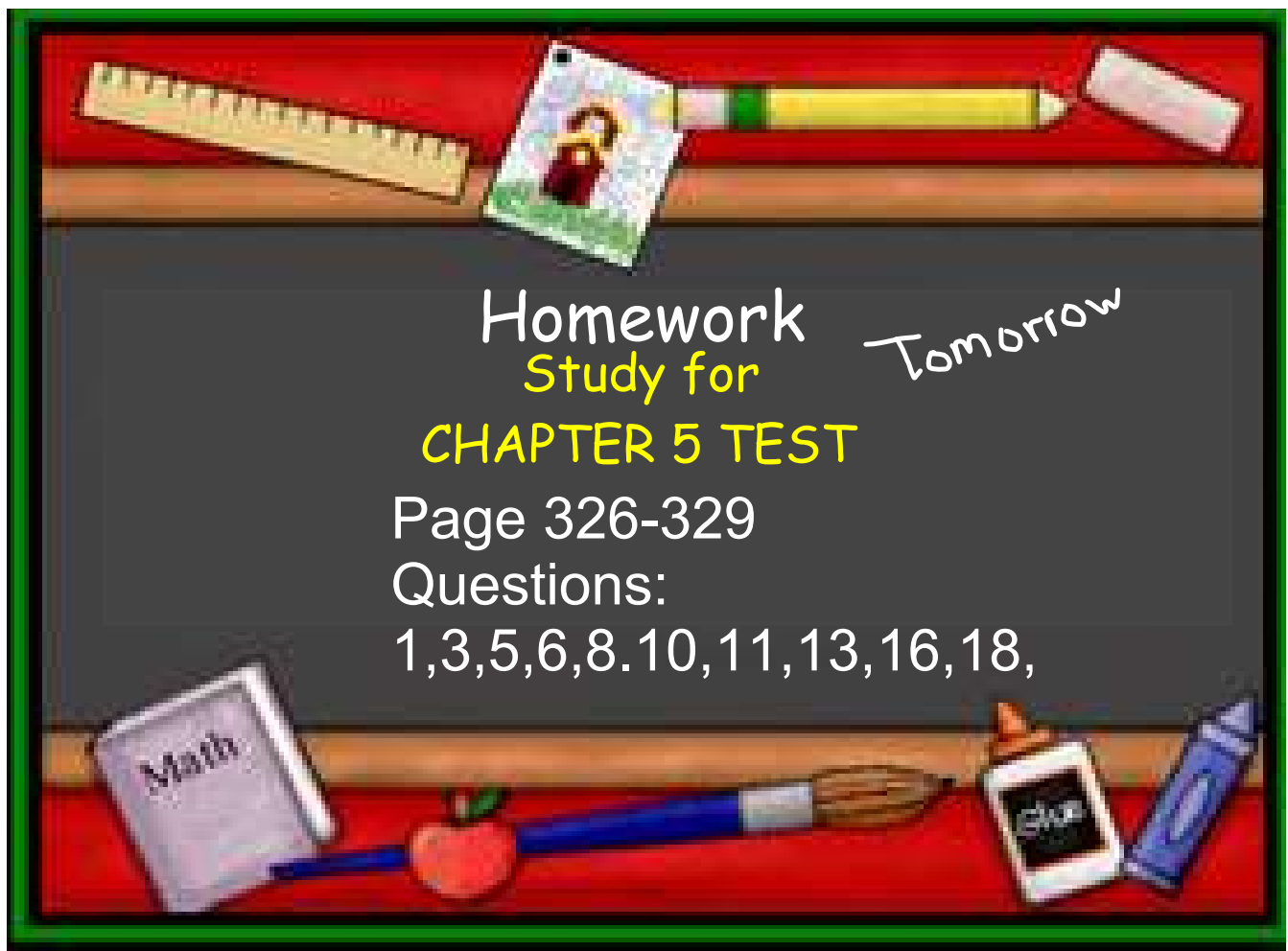
Cost of Publishing a Yearbook



CHECK YOUR UNDERSTANDING



5.7 Interpreting Graphs of Linear Functions



$$5) P(n) = 5n - 300$$

Function Notation

$$a) P = 5n - 300$$

Equation

$$\begin{aligned} b) P(150) &= 5(n) - 300 \\ &= \underbrace{5(150)}_{750} - 300 \\ P(150) &= 450 \end{aligned}$$

If 150 students attended we would have a profit of \$450

$$c) P(n) = 700$$

$$\begin{aligned} P(n) &= 5n - 300 \\ \underbrace{700}_{\$700} - 300 &= 5n - 300 - 300 \\ 400 &= \frac{5n}{5} \end{aligned}$$

$$\boxed{200 = n}$$

In order to have a profit \$700 the 200 students must attend