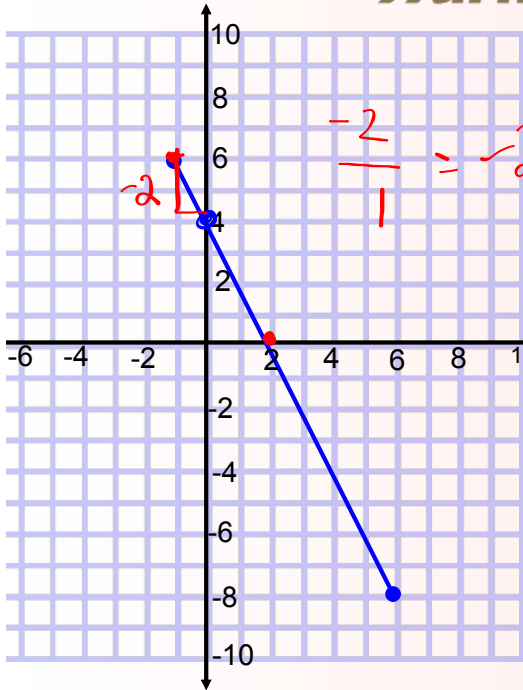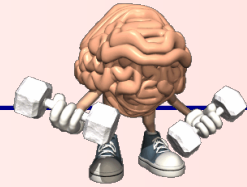# Warm Up

$\dfrac{-2}{1} = -2$

State the :

Domain: $-1 \le x \le 6$

Range: $-8 \le y \le 6$

~~Function/Nonfunction:~~

~~Linear/Non-linear:~~

~~Discrete/Continuous:~~

x Intercept= $(2,0)$

y Intercept= $(0,4)$

Rate of change= -2

Equation:

$y = mx + b$

ROC   y int

$y = -2x + 4$

$y = 3x + 6$ $f(x) = 3x + 6$

$g(x) = -7x + 2$

Find: ① x intercept of $f(x)$

② y int of $g(x)$ y int $(0,2)$

③ $g(7) = -7(7) + 2 = -47$

④ $f(x) = 33$ find x

$0 = 3x + 6$

$-6 = 3x$
$\dfrac{-6}{3} = \dfrac{3x}{3}$

$\boxed{x = -2}$

$(-2, 0)$

$33 = 3x + 6$

$\dfrac{27}{3} = \dfrac{3x}{3}$ $\boxed{x = 9}$

Function/Nonfunction
└→ graph (Vert line test)
only 1 y → ordered pairs
for every x → table or arrow diagram

Linear / Non-linear
└→ graph → straight line
→ table of values → constant ROC
→ equation. $y = mx + b$

Discrete vs. Continuous
Domain + Range
x int → graph $0 \le y$ $y \ge 0$
→ or substituting. 0 in
for y in an equation

y int → graph
→ $y = mx + \boxed{b}$
→ substituting 0 in for x

ROC → graph $\left(\frac{rise}{run}\right)$
→ equation $y = \boxed{m}x + b$
→ 2 points $\frac{y_2 - y_1}{x_2 - x_1}$
→ table $\frac{change\ in\ y}{change\ in\ x}$

Function Notation:
→ substitute values in for x
and solve for $f(x)$.
→ substitute values in for $f(x)$
and solve for x.
→ Ex. $f(g(1))$
Ex. $\frac{f(4)}{g(5)}$ (use operations)

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7. This graph shows the area, A square metres, that paint covers as a function of its volume, V litres.
   a) What is the rate of change? What does it represent?
   b) What area is covered by 6 L of paint?
   c) What volume of paint would cover 45 m²?

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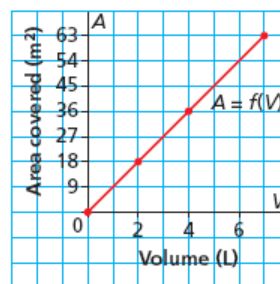
8. The graphs below show the temperature, T degrees Celsius, as a function of time, t hours, at different locations.

a) Which graph has a rate of change of 5°C/h and a vertical intercept of -10°C?

b) Which graph has a rate of change of -10°C/h and a vertical intercept of 20°C?

i)

ii)

iii)

iv)
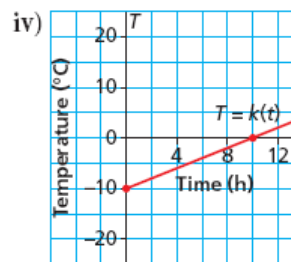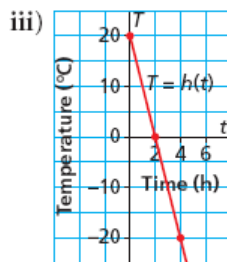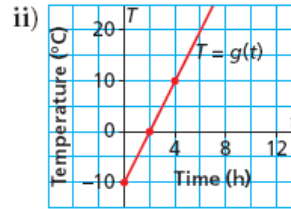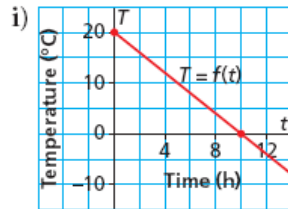
5.7 Interpreting Graphs of Linear Functions

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.

Cost of Running a Backhoe

a) Determine the vertical and horizontal intercepts. Write the coordinates of the point where the graph intersects the axes. Describe what the point represents.

b) Determine the rate of change. What does it represent?

c) Write the domain and range.

d) What is the cost to run the backhoe for 7 h?

e) For how many hours is the backhoe run when the cost is $360?
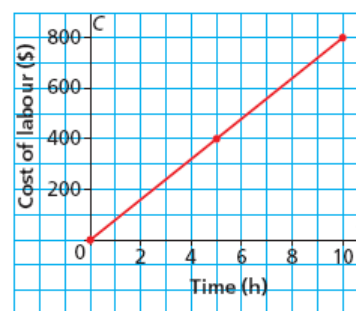
5.7 Interpreting Graphs of Linear Functions

13. The capacity of each of 2 fuel storage tanks is 100 m³. 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.
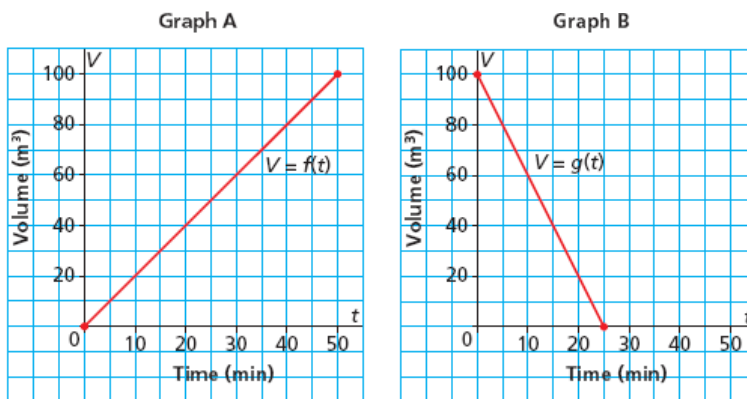
Graph A

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?

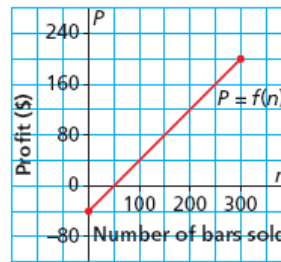5.7 Interpreting Graphs of Linear Functions

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) $V(d) = 55 - 0.08d$

5.7 Interpreting Graphs of Linear Functions

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?
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?

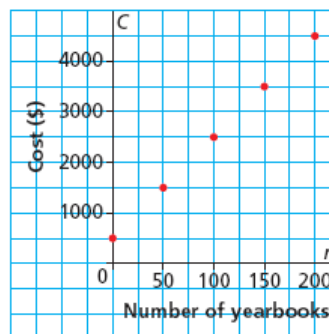5.7 Interpreting Graphs of Linear Functions

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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?

Cost of Publishing a Yearbook

✓ **SOLUTION**

CHECK YOUR UNDERSTANDING

5.7 Interpreting Graphs of Linear Functions