

# Foundations of Mathematics, Grade 9 (MFM1P)

## Course Description

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**Course Title:** Foundations of Mathematics  
**Course Code:** MFM1P  
**Grade:** 9

**Course Type:** Applied  
**Credit Value:** 1.0  
**Prerequisite:** None

- **This course builds on** your knowledge from grade 8 mathematics
- **It leads you to** MFM2P
- **You will also have the option to take** a transition course preparing you for Academic-level math courses

**Official Ontario Ministry of Education secondary curriculum available here:**  
<http://www.edu.gov.on.ca/eng/curriculum/secondary/math.html>

### **This course focuses on three main strands:**

Number Sense and Algebra

Linear Relations

Measurement and Geometry

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### Number sense and algebra:

Students will use their number sense and algebra to solve problems. For example:

What is the length of a rectangle if the perimeter is 59 cm and the width is 12 cm?

$$\begin{aligned}p &= 2l + 2w \\59 &= 2l + 2(12) \\59 &= 2l + 24 \\59 - 24 &= 2l \\35 &= 2l \\ \frac{35}{2} &= l \\17.5\text{cm} &= l\end{aligned}$$

They will also make comparisons using unit rates to solve problems. For example: If 500 mL of juice costs \$2.29, the unit rate is 0.458¢/mL. If 750 mL of juice costs \$3.59, the unit rate is 0.479¢/mL, making it the less economical option.

Unit rate for 500ml

$$\begin{aligned}\$2.29 \div 500\text{ml} &= \frac{\$0.00458}{\text{ml}} \\ &\text{or} \\ &= \frac{0.458\text{¢}}{\text{ml}}\end{aligned}$$

Unit rate for 750ml

$$\begin{aligned}\$3.59 \div 750\text{ml} &= \frac{\$0.00479}{\text{ml}} \\ &\text{or} \\ &= \frac{0.479\text{¢}}{\text{ml}}\end{aligned}$$

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**Problem:** When placing a ladder on a wall you must not exceed the 4-to-1 rule (i.e. for every four feet of height you have to climb, move the base one foot away from the wall). Follow this rule for safety: for each four feet you go vertically, you must place the ladder one foot horizontally out from the wall.

If you want to go 16 feet vertically up a wall, what is the minimum distance away from the wall that you must place the ladder (don't worry about determining the length of the ladder).

### Solution:

There are often multiple ways to solve a problem

Height (ft)	Distance from wall (ft)
4	1
8	2
12	3
16	4

The ladder must be 4 feet away from the wall

4 : 1 is equivalent to 16 : ?

$$\frac{4}{1} = \frac{16}{x}$$

$$4 = \frac{16}{x} \quad \text{Divide 4 by 1 to simplify}$$

$$4x = 16 \quad \text{Multiply both sides by } x$$

$$\frac{4x}{4} = \frac{16}{4}$$

Divide both sides by 4

$$x = 4$$

The ladder must be 4 feet from the wall.

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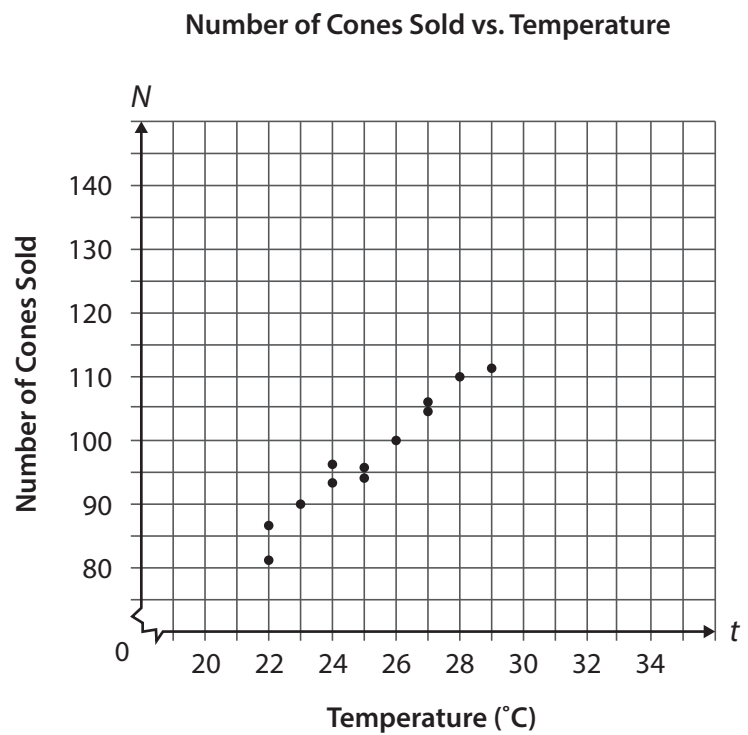
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### Linear relations:

Students will use tables, graphs and equations to answer questions like this:

If Malia records the number of ice cream cones she sells and the maximum temperature each day in the summer, how can she use the graph below to predict the approximate number of ice cream cones she could sell when the temperature is  $36^{\circ}$ ?



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**Problem:** Dodgers (a new cell phone company) is promoting the new iCell 7 offering the device for \$200.00, if you purchase a data plan of \$70.00 each month. This can be represented by the equation  $C = 200 + 70m$

How much Money will this plan cost TOTAL over two years (before tax)?

There are often different ways to solve a problem

1) Solve algebraically

$12 + 12 = 24$  months in 2 years

$$C = 200 + 70m$$

$$C = 200 + 70(24)$$

$$C = 200 + 70(24)$$

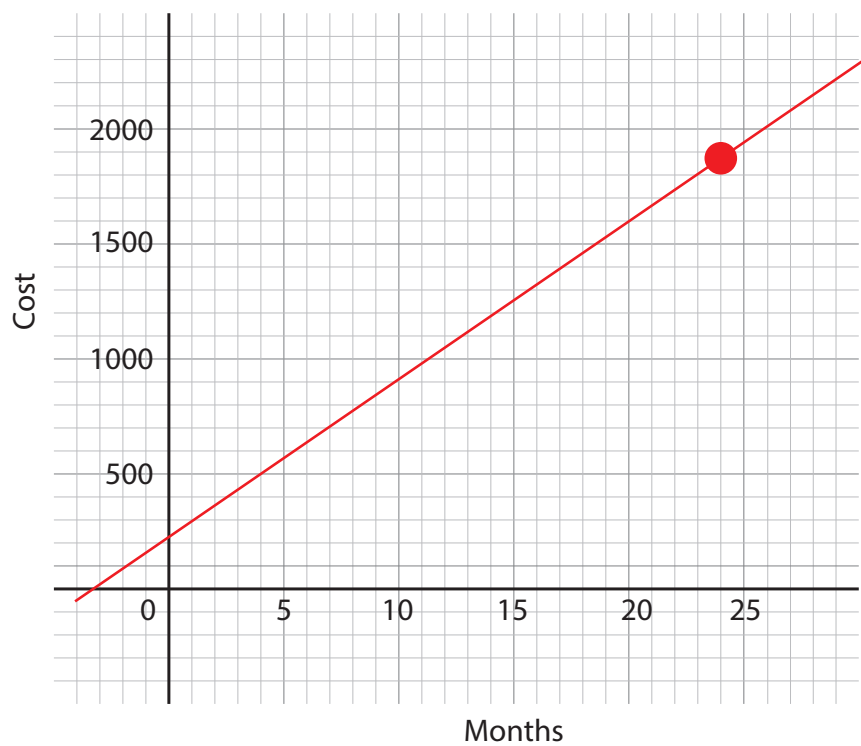
$$C = 200 + 1680$$

$$C = 1880$$



You will pay \$1880.00 for the phone and phone plan in two years.

2) Solve graphically



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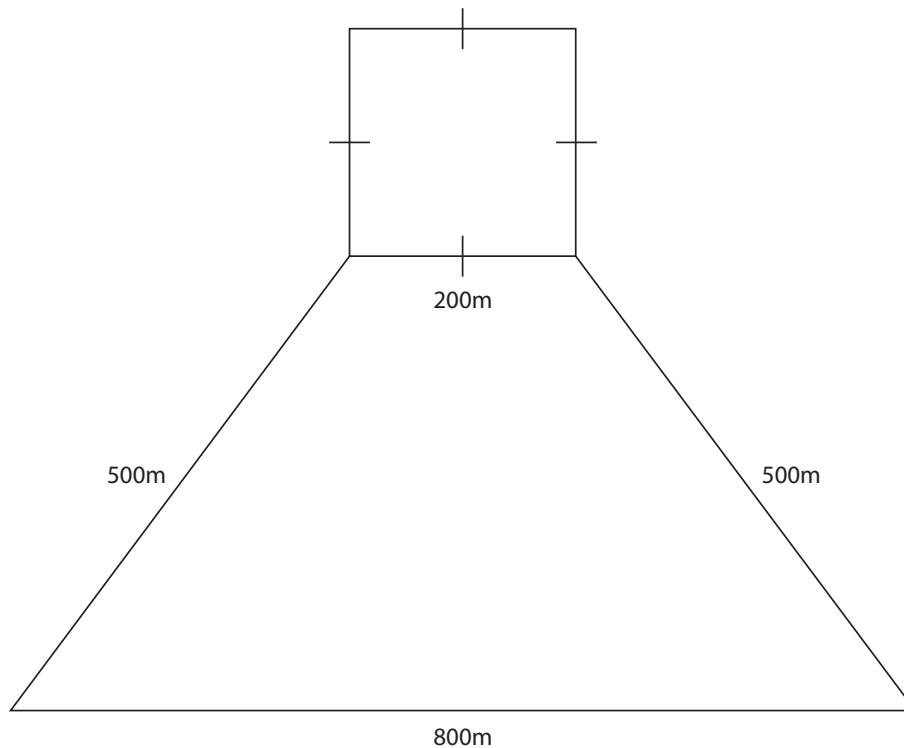
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### Measurement & geometry:

Students will work with combinations of rectangles, triangles, parallelograms, trapezoids and circles to solve problems like this:

A new park is in the shape of an isosceles trapezoid with a square attached to the shortest side. The side lengths of the trapezoidal section are 200 m, 500 m, 500 m and 800 m, and the side length of the square section is 200 m. If the park is to be fully fenced and sodded, how much fencing and sod are required?



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**Problem:** You are constructing a railing for your staircase. The staircase is sloped  $38^\circ$  off the ground. You are installing the railing, which needs to be parallel to the staircase, and each wooden support bar must be  $90^\circ$  from each stair. The staircase is represented by the following diagram. Without any additional measuring, determine the missing angles around the support beams (fill in the blanks).

**Solution:**

