Math 9
SECTION 7.1 AND 2 EXTRA: Maps Worksheet

Name: key

Period:

1. On a map with a scale of 1 : 50 000 000, what actual distance, in kilometres, is represented by 4 cm?

$$\frac{1}{50,000,000} = \frac{4}{x}$$ ×4

$x = 200,000,000$ cm

$200,000,000 \div 10^5$

= 2000 km

2. On a map with a scale of 1 : 100 000 000 what distance, in centimetres, represents an actual distance of 2500 km?

$$\frac{1}{100,000,000} = \frac{x}{250,000,000 \text{ cm}}$$ ×2.5

$x = 2.5$ cm

2500km
$= 2500 \times 10^5$
$= 2500,00 00,000$

3. Charlottetown is 976 km from Ottawa. How far apart are they on a map with a scale of 1 : 20 000 000?

$$\frac{1}{20,000,000} = \frac{x}{97,600,000}$$ ×4.88

÷ 488

$x = 4.88$ cm

976×10^5
$= 97,600,000$

4. St. John's is 2125 km from Toronto. How far apart are they on a map with a scale of 1 : 50 000 000?
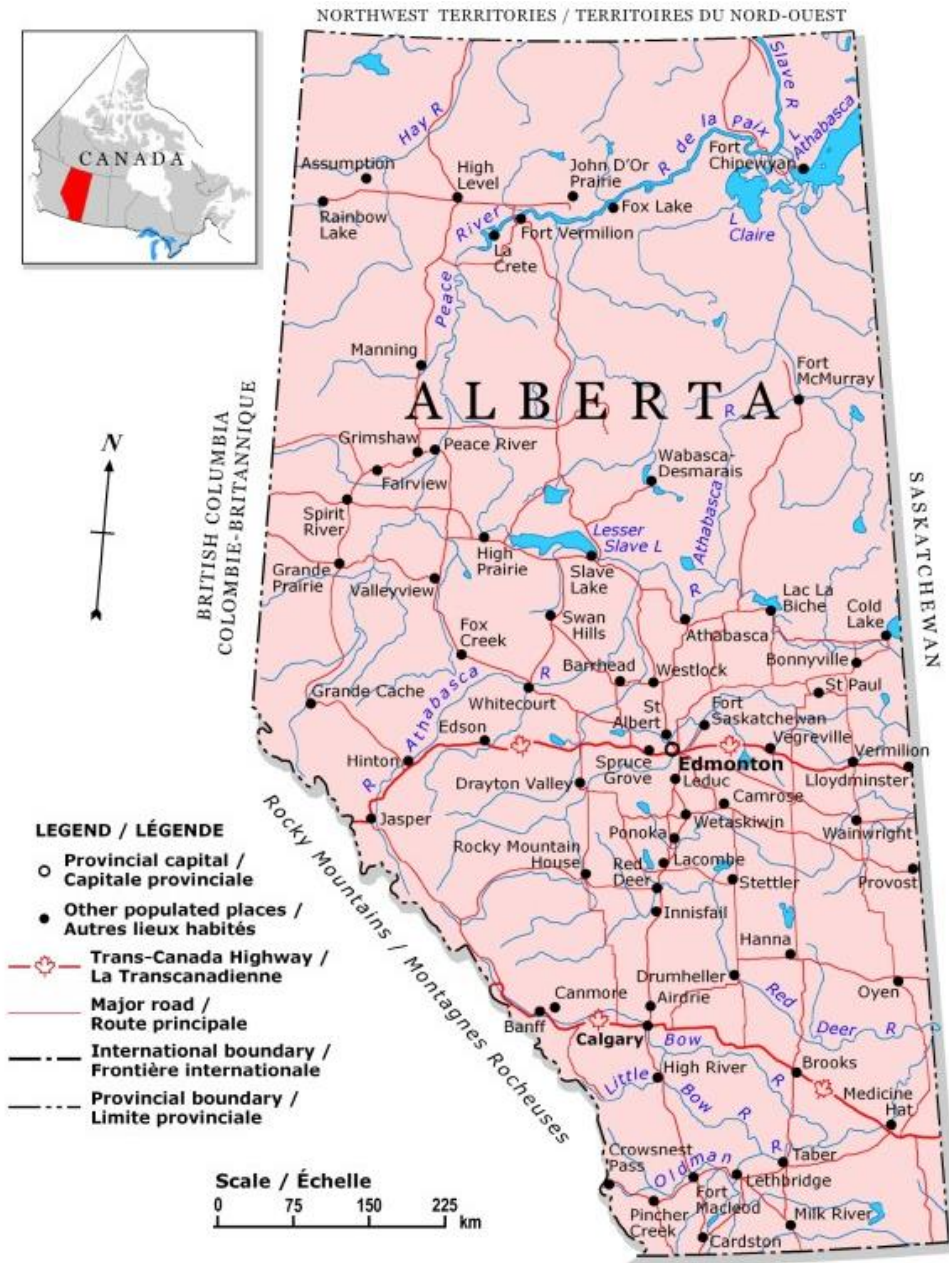
$$\frac{1}{50,000,000} = \frac{x}{212,500,000}$$ ×4.25

÷ 4.25

$x = 4.25$ cm

2125×10^5
$= 212,500,000$

5. If two cities are 5.8 cm apart on a map and the actual distance between them is 145 km, what is the scale of the map?

145km
$= 145 \times 10^5$
$= 14,500,000$ cm.

Scale Factor = model : actual

5.8 : 14,500,000

Use the following map of Alberta to answer the following questions.

1. Determine the scale factor of the map with the units shown:

(i) 1 cm : __75__ km   (ii) 1 cm : __7,500,000__ cm

$$75 \times 10^5 = 7,500,000$$

(ii) Which of the above do you think will be easier to use? Explain.

1 cm : 75 km , cm is too small of a unit to use here.

2. Use the scale to determine the approximate straight line distance between:

(a) Calgary and Edmonton

$$\frac{1\,cm}{75\,km} \xrightarrow{\times 4} = \frac{4\,cm}{x\,km} \quad \xrightarrow{\times 4}$$

$$x = 75 \times 4$$
$$= 300\,km$$

(b) St. Albert and Red Deer

$$\frac{1\,cm}{75\,km} \xrightarrow{\times 2} = \frac{2\,cm}{x\,km} \quad \xrightarrow{\times 2}$$

$$x = 75 \times 2$$
$$= 150\,km$$

(c) Innisfail and Drumheller

$$\frac{1\,cm}{75\,km} \xrightarrow{\times 1.3} = \frac{1.3\,cm}{x\,km} \quad \xrightarrow{\times 1.3}$$

$$x = 75 \times 1.3$$
$$= 97.5\,km$$

Use the following map of Ontario to answer the following questions.

1. Determine the scale factor of the map with the units shown:

(iii) 1 cm : _100_ km (ii) 1 cm : _10,000,000_ cm

100×10⁵

2. Use the scale to determine the approximate straight line distance between:

(a) Thunder Bay and Cochrane

$$\frac{1\,cm}{100\,km} = \frac{6.2\,cm}{x\,km}$$

$\times 6.2$ (top), $\times 6.2$ (bottom)

$$x = 100 \times 6.2$$
$$= 620\,km$$

(b) Toronto to Ottawa

$$\frac{1\,cm}{100\,km} = \frac{3.6\,cm}{x\,km}$$

$\times 3.6$ (top), $\times 3.6$ (bottom)

$$x = 100 \times 3.6$$
$$= 360\,km$$

(c) Windsor to Fort Severn

$$\frac{1\,cm}{100\,km} = \frac{15.8\,cm}{x\,km}$$

$\times 15.8$ (top), $\times 15.8$ (bottom)

$$x = 100 \times 15.8$$
$$= 1580\,km$$

3. Calculate the approximate driving distance from Thunder Bay to Cochrane. How much longer is it than the straight line distance calculated above?

Use a string to measure the approximate driving distance.

4. What is the approximate width of Ontario? What length did you measure to determine the answer?

$$\frac{1\,cm}{100\,km} = \frac{16.5\,cm}{x\,km}$$

$\times 16.5$ (top), $\times 16.5$ (bottom)

$$x = 16.5 \times 100$$
$$= 1650\,km$$

from left most to right most point on the map.

Road Maps

1. The official road map of Ontario has a scale of 1:700 000. Explain what this ratio means. *For every unit on the map, it is equivalent to 700,000 of the same unit in actual life.*

2. How many kilometres does 1 cm on the map represent?

   $700,000 \div 10^5 = 7 \text{km}$

3. Calculate the actual distances represented on the official Ontario road map by:

(a) 3 cm

$\dfrac{1cm}{7km} \xrightarrow{\times 3} \dfrac{3cm}{xkm}$

$\xrightarrow{\times 3}$ $x = 21 km$

(b) 0.8 cm $\times 0.8$

$\dfrac{1cm}{7km} \xrightarrow{} \dfrac{0.8cm}{xkm}$ $x = 5.6 km$

$\times 0.8$

4. Use this map to complete the table of driving distances.

Lake Ontario   N   Niagara-on-the-Lake
Hamilton
Stoney Creek   Youngstown
                St. Catharines
Grimsby   NY
   Lincoln
      Thorold
         Niagara Falls
   Welland
            Fort Erie
Port Colborne   Buffalo
Map Scale 1:700 000   Lake Erie

Hint
A piece of string is a handy tool for measuring distances on the map when the roads are not straight.
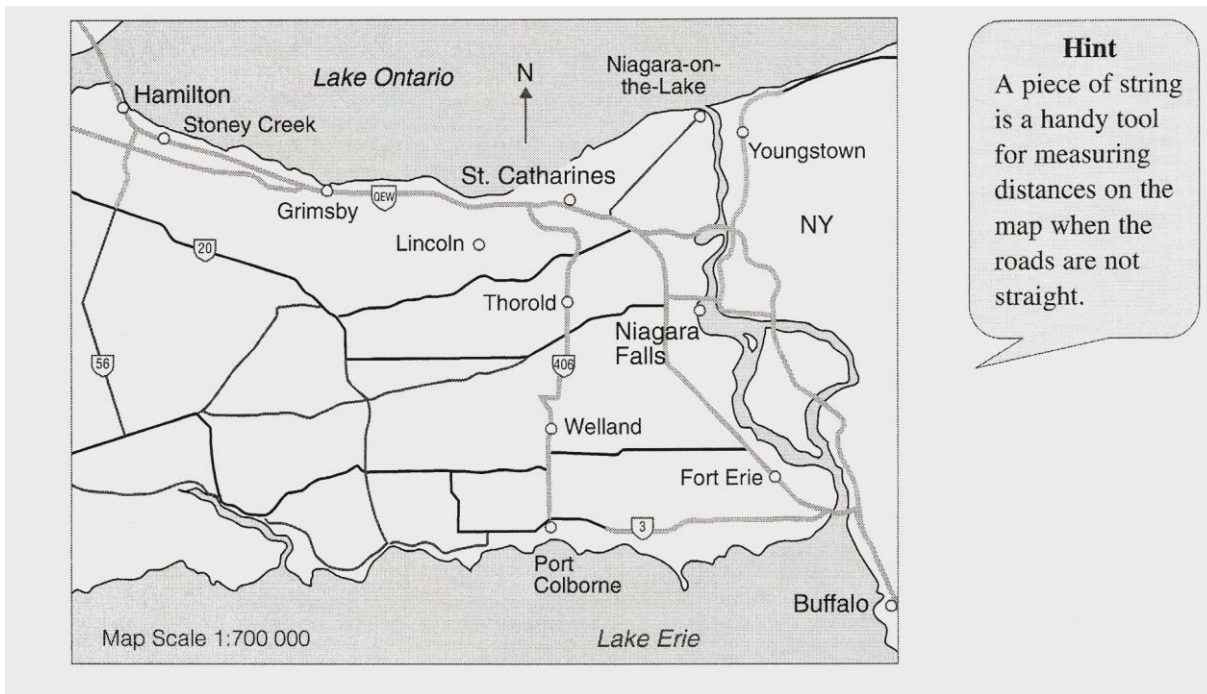
Trip	Distance on Map (nearest 0.1 cm)	Actual Driving Distance (nearest km)
St. Catharines to Fort Erie		
Niagara-on-the-Lake to Welland		
Thorold to Youngstown, NY		
Port Colborne to Grimsby		