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Dear Parents,

Helping kids understand and apply mathematics knowledge and skills is a collective responsibility of parents, teachers, and principals.

Students need to learn mathematics in a way that will serve them throughout their lives. Understanding mathematics can provide our students with many job and career opportunities.

This is why students need to know why mathematics works the way it does, how to use it with confidence and competence when solving problems.

Understanding mathematics enables us to:

- Solve problems, make sound decisions and perform calculations with ease
- Explain how we solved a problem and why we made a particular decision
- Understand patterns and trends so that we can make predictions
- Understand Financial Literacy to manage time and money
- Handle everyday situations that involve numbers and feel confident

Before your child can learn mathematics, he or she needs to believe in his or her ability to do so. That's where you come in!

Parents, you are your child's first role model for learning. When you engage with your child in a supportive, relaxed atmosphere, your child will enjoy exploring the world of mathematics.

Dynamic Math is committed to helping parents and students. We understand that not everyone learns the same way, and not everyone feels the same about math. This is why we are continually working to create math resources that help students of all abilities, while supporting the many learning styles and varying levels of enthusiasm towards math.

From our clear concise instructions and straightforward guided examples to our additional practice material and tests, there's something to suit everyone. Combined with our video tutorials, students will be able to get a tutor-like experience from anywhere and at a fraction of the cost of standard tutoring or after-school help programs.

Grade 10 Mathematics

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STUDENT REFERENCE SHEET

Selected Mathematical Formulae and Tables of Conversions

Conversions

<u>Common Imperial</u>	<u>Imperial/Metric</u>	<u>Metric</u>
• 1 foot = 12 inches	• 1 inch \approx 2.54 cm	• 1 cm = 10 mm
• 1 yard = 36 inches	• 1 foot \approx 0.3048 m	• 1 m = 100 cm
• 1 yard = 3 feet	• 1 yard \approx 0.9144 m	• 1 km = 1000 m
• 1 mile = 5280 feet	• 1 mile \approx 1.609 km	
• 1 mile = 1760 yards		
• 1 pound = 16 ounces	• 1 pound \approx 0.454 kg	• 1 t = 1000 kg
• 1 ton = 2000 pounds	• 1 ounce \approx 28.35 g	• 1 kg = 1000 g

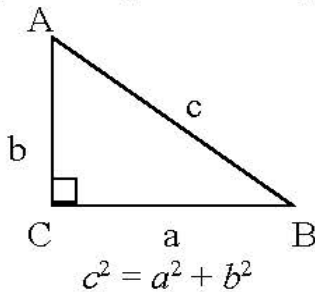
Area and Circumference

- Area of a Triangle: $A = \frac{1}{2}bh$
- Area of a Circle: $A = \pi r^2$
- Circumference of a Circle: $C = 2\pi r$

Straight Lines and Slope

- $y = mx + b$
- $Ax + By + C = 0$
- $y - y_1 = m(x - x_1)$
- Slope: $m = \frac{\text{rise}}{\text{run}} = \frac{\Delta y}{\Delta x} = \frac{y_2 - y_1}{x_2 - x_1}$

Right Triangles and Trig Ratios

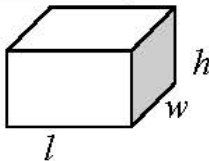


$$\text{Sin } B = \frac{\text{opposite}}{\text{hypotenuse}} = \frac{b}{c}$$

$$\text{Cosine } B = \frac{\text{adjacent}}{\text{hypotenuse}} = \frac{a}{c}$$

$$\text{Tangent } B = \frac{\text{opposite}}{\text{adjacent}} = \frac{b}{a}$$

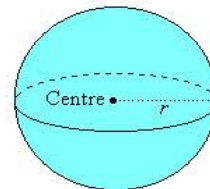
Rectangular Solid



Surface Area = $2lw + 2lh + 2wh$

Volume = lwh

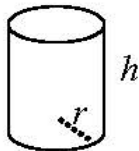
Sphere



Surface Area = $4\pi r^2$

Volume = $\frac{4}{3}\pi r^3$

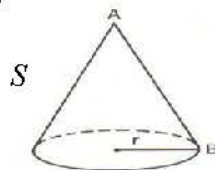
Cylinder



Surface Area = $2\pi rh + 2\pi r^2$

Volume = $\pi r^2 h$

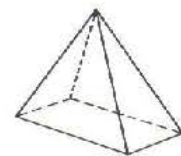
Cone



Surface Area = $\pi rS + \pi r^2$

Volume = $\frac{1}{3}\pi r^2 h$

Pyramid



Surface Area = Area of Δ 's + base

Volume = $\frac{1}{3}(\text{area of base})h$

CHAPTER 1

LINEAR MEASUREMENT AND PROPORTIONAL REASONING

- 1.1 The SI and Imperial Systems of Measure
- 1.2 Units of Length in SI and Imperial Systems
- 1.3 Converting Units of Length Within Each System
- 1.4 Units of Measure – Estimating Length With Referents
- 1.5 Solving Problems Involving Linear Measure
- 1.6 Ratio and Proportional Reasoning
- 1.7 Converting Systems of Measure Using Unit Analysis
- 1.8 Converting Systems of Measure Using Proportional Reasoning

1.1 The SI and Imperial Systems of Measure

There are two main systems of measure used in North America. One is the **Imperial system** (sometimes called the British Engineering System) and the other is the **metric system**. In this chapter, we will work with units of length in both systems and use proportional reasoning to convert from one to the other.

More than one version of the metric system is used throughout the world. We will work with the most common version, called the International System of units, usually referred to as the **SI Metric system**. It is the modern form of the metric system, developed in 1960, and devised around the convenience of the number ten. It is the world's most widely used system of measurement, both in everyday commerce and in science.

Until recently, the imperial system of measure was used most often in Canada, Britain, and the United States, while much of the rest of the world used the metric system. In recent years, Canada has been converting from imperial to metric. For example, we see distance referred to as miles in some cases and in kilometres in others. As a result, we need to be familiar with both systems.


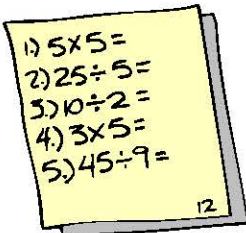
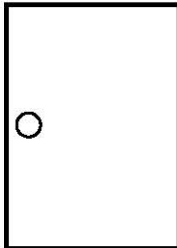

The **Imperial system** of measure involves common units of length, such as the inch, foot, yard, and mile. Liquid measures of volume in this system include the teaspoon, tablespoon, cup, quart, and gallon. Mass (weight) includes the ounce, pound, and ton. In the **SI Metric system**, the most common units of length include the metre, centimetre, and kilometre. Common liquid measures of volume are the litre, millilitre, and kilolitre. Units of mass include the gram, milligram, kilogram, and tonne.

A summary of the most common units is shown in the table below. In the rest of this chapter we will be working with units of length in both systems.

Common Measures in Imperial	Common Measures in SI Metric
Length <ul style="list-style-type: none"> ▪ inch, foot, yard, and mile 	Length <ul style="list-style-type: none"> ▪ centimetre (cm), metre (m), and kilometre (km)
Liquid Volume <ul style="list-style-type: none"> ▪ teaspoon, tablespoon, cup, quart, and gallon 	Liquid Volume <ul style="list-style-type: none"> ▪ millilitre (ml), litre (l), and kilolitre (kl)
Mass <ul style="list-style-type: none"> ▪ ounce, pound, and ton 	Mass <ul style="list-style-type: none"> ▪ milligram (mg), gram (g), and kilogram (kg)

Linear Measures of Common Objects

Before converting from one unit of length to another, let's take a look at how some of these units compare to common everyday objects.

Common Object (The following objects are not shown to scale.)	Length in Imperial Measure	Length in SI Metric Measure
 Typical Hand-Held Calculator	<u>Width</u> About 3 inches <u>Length</u> About 5.5 inches	<u>Width</u> About 7.5 cm <u>Length</u> About 14 cm
 A page in this text book	<u>Width</u> About 8.5 inches <u>Length</u> About 11 inches	<u>Width</u> About 21.5 cm <u>Length</u> About 28 cm
 Bedroom Door	<u>Width</u> About 2.5 feet <u>Height</u> About 6.5 feet	<u>Width</u> About 75 cm <u>Height</u> About 200 cm (or 2 m)
 Dime	<u>Diameter</u> About 0.6 inches	<u>Diameter</u> About 1.5 cm

1.2 Units of Length in SI and Imperial Systems

Linear Measure (or Length)

Length is a measure involving only one dimension. Linear measure is the measurement of distances between two points or along a curved line. (How long a figure is or the distance around an object.)

Examples:

- How many hand widths is the height of a horse?
- How many footsteps long is a living room?
- How many inches long is it around your waist?
- How many metres of fencing are needed to enclose your back yard?

Units of Linear Measure in the SI Metric System

The basic unit of length in SI is the **metre (m)**. You can think of the following measures of length in terms of one metre

- about half the height of a door
- the width of a twin bed
- the perimeter of this page

Commonly used metric units of length are the **metre (m)**, **centimetre (cm)**, **millimetre (mm)**, and **kilometre (km)**. Following are some examples comparing these lengths.

- A metre is about the width of a front door.
- The width of this page is about 20 cm.
- A millimetre is about the thickness of a dime.
- A kilometre is about length of the perimeter of the school yard.

The **centimetre (cm)** is one hundredth of a metre. The following objects can be thought of in terms of length in centimetres.

- The length of your thumb nail is a little more than 1 cm.
- The length of a pen is about 15 cm.
- The length of a small paper clip is about 3 cm.
- The width of a penny is about 2 cm.

The **kilometre (km)** is equal to 1000 metres. The following distances can be thought of in terms of a kilometre.

- the length of 9 or 10 football fields
- length of a brisk 10-minute walk

Units of Linear Measure in the Imperial System

The most common units of linear measure in the Imperial system are the inch, foot, yard, and mile.

You can think of these measures in the following ways:

- Your thumb is about 2 inches long.
- A pen is about 6 inches long.
- A tall man is about 6 feet tall.
- The length of this page is a little less than 1 foot.
- The width of the front door of the school is about 1 yard.
- The distance (length) around the school yard is about 1 mile.

Use of measuring devices

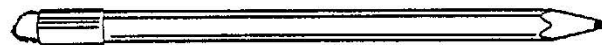
The most common instruments used to measure length are the ruler, yard (or metre) stick, and the tape measure. Notice that most rulers show length in both measurement systems (SI Metric and Imperial)

In cases where we want the distance around a circular object, we could use either a flexible tape measure or a piece of string. If a piece of string were used, it would be wrapped around the object and then straightened out and measured with a ruler.

Exercises 1.2

1. Use a ruler to measure the length of each of the following objects to (i) the nearest centimetre and (ii) the nearest inch.

a.



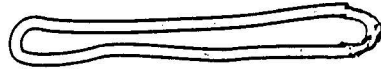
(i). _____ cm (ii). _____ inches

b.



(i). _____ cm (ii). _____ inches

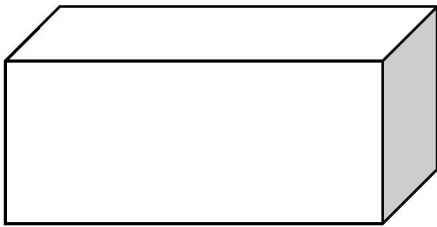
c.



(i). _____ cm (ii). _____ inches

2. Use a ruler to measure the dimensions of the following figures.

a.



(i). To the nearest centimetre

Length = _____ cm

Width = _____ cm

Height = _____ cm

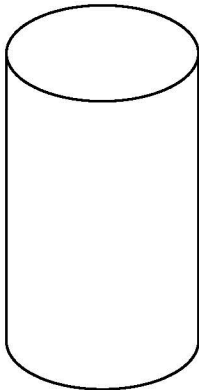
(ii). To the nearest half inch

Length = _____ inches

Width = _____ inches

Height = _____ inches

b.



(i). To the nearest centimetre

Height = _____ cm

Diameter = _____ cm

(ii). To the nearest half inch

Height = _____ inches

Diameter = _____ inches

3. Draw a three-dimensional outline of a shoebox with the following dimensions: length 6 cm, width 4 cm, and height 3 cm.



4. Draw a three-dimensional outline of a soup can with the following dimensions: height = 4 cm and diameter = 2 cm.



1.3 Converting Units of Length Within Each System

The SI Metric System

Since the metric system is based on place values of 10, we begin with a metre and either multiply or divide by powers of 10 to get other units of length.

$$1 \text{ kilometre (1 km)} = 1000 \text{ metres (1000 m)}$$

$$1 \text{ metre (1 m)} = 100 \text{ centimetres (100 cm)}$$

$$1 \text{ centimetre (1 cm)} = 10 \text{ millimetres (10 mm)}$$

Examples:

To go from metres to centimetres,
multiply by 100.

$$5 \text{ m} = 5 \times 100 = 500 \text{ cm}$$

$$23 \text{ m} = 23 \times 100 = 2300 \text{ cm}$$

$$1.2 \text{ m} = 1.2 \times 100 = 120 \text{ cm}$$

To go from centimetres to metres,
divide by 100.

$$650 \text{ cm} = 650 \div 100 = 6.5 \text{ m}$$

$$12 \text{ cm} = 12 \div 100 = 0.12 \text{ m}$$

$$7.8 \text{ cm} = 7.8 \div 100 = 0.078 \text{ m}$$

To go from kilometres to metres,
multiply by 1000.

$$7 \text{ km} = 7 \times 1000 = 7000 \text{ m}$$

$$2.5 \text{ km} = 2.5 \times 1000 = 2500 \text{ m}$$

$$0.6 \text{ km} = 0.6 \times 1000 = 600 \text{ m}$$

To go from metres to kilometres,
divide by 1000.

$$25000 \text{ m} = 25 \text{ km}$$

$$1300 \text{ m} = 1.3 \text{ km}$$

$$425 \text{ m} = 0.425 \text{ km}$$

Keep in mind the following place value chart for metric measures of length.

Unit of Measure	kilo 1000 km	hecto 100 hm	deca 10 dam	unit 1 m	deci $\frac{1}{10}$ dm	centi $\frac{1}{100}$ cm	milli $\frac{1}{1000}$ mm
Length				metre			

Examples: Convert each of the following from one metric unit to another.

1. $7.5 \text{ m} = \underline{\quad} \text{ cm}$ Each metre is equal to 100 cm, so $7.5 \text{ m} = 7.5 \times 100 = 750 \text{ cm}$.
2. $25 \text{ cm} = \underline{\quad} \text{ m}$ Each centimetre is $\frac{1}{100}$ of a metre, so $25 \text{ cm} = 25 \div 100 = 0.25 \text{ m}$.
3. $3 \text{ km} = \underline{\quad} \text{ m}$ Each kilometre is equal to 1000 m, so $3 \text{ km} = 3 \times 1000 = 3000 \text{ m}$.
4. $335 \text{ m} = \underline{\quad} \text{ km}$ Each metre is equal to $\frac{1}{1000}$ of a kilometre,
so $335 \text{ m} = 335 \div 1000 = 0.335 \text{ km}$.
5. $7.2 \text{ cm} = \underline{\quad} \text{ mm}$ Each centimetre is equal to 10 millimetres,
so $7.2 \text{ cm} = 7.2 \times 10 = 72 \text{ mm}$.
6. $9 \text{ mm} = \underline{\quad} \text{ cm}$ Each millimetre is equal to $\frac{1}{10}$ centimetre,
so $9 \text{ mm} = 9 \div 10 = 0.9 \text{ cm}$.

The Imperial System

In the SI Metric system, we could either multiply or divide by powers of 10 to convert from one unit to another. This is not the case with the Imperial system. We need to memorize different relationships between different measures.

The following chart shows the relationships among the most common linear measures:

1 foot = 12 inches	1760 yards = 1 mile
3 feet = 1 yard	5280 feet = 1 mile

Examples: Convert each of the following from one Imperial unit to another.

1. $5 \text{ feet} = \underline{\quad} \text{ inches}$ 1 foot equals 12 inches, so $5 \text{ ft} = 5 \times 12 = 60 \text{ inches}$
2. $48 \text{ inches} = \underline{\quad} \text{ feet}$ 1 inch equals $\frac{1}{12}$ of a foot, so $48 \text{ inches} = 48 \div 12 = 4 \text{ feet}$
3. $3.5 \text{ miles} = \underline{\quad} \text{ feet}$ 1 mile = 5280 feet, so $3.5 \text{ miles} = 3.5 \times 5280 = 18\,480 \text{ feet}$
4. $5.4 \text{ yards} = \underline{\quad} \text{ inches}$ 1 yard = 3 feet = $3 \times 12 = 36 \text{ inches}$, so
 $5.4 \text{ yards} = 5.4 \times 36 = 194.4 \text{ inches}$
5. $90 \text{ inches} = \underline{\quad} \text{ yards}$ 1 inch = $\frac{1}{36}$ of a yard, so $90 \text{ inches} = 90 \div 36 = 2.5 \text{ yards}$

$$6. \quad 1.2 \text{ miles} = \underline{\hspace{1cm}} \text{ yards} \quad 1 \text{ mile} = 1760 \text{ yards, so } 1.2 \text{ miles} = 1.2 \times 1760 = 2112 \text{ yards}$$

$$7. \quad 16\,368 \text{ feet} = \underline{\hspace{1cm}} \text{ miles} \quad 1 \text{ foot} = \frac{1}{5280} \text{ miles, so } 16\,368 \text{ feet} = 16\,368 \div 5280 = 3.1 \text{ miles}$$

Exercises 1.3

1. Convert each of the following units of length.

a. $3 \text{ km} = \underline{\hspace{1cm}} \text{ m}$

b. $5 \text{ m} = \underline{\hspace{1cm}} \text{ cm}$

c. $20 \text{ cm} = \underline{\hspace{1cm}} \text{ mm}$

d. $3 \text{ mm} = \underline{\hspace{1cm}} \text{ cm}$

e. $200 \text{ cm} = \underline{\hspace{1cm}} \text{ m}$

f. $500 \text{ m} = \underline{\hspace{1cm}} \text{ km}$

g. $25 \text{ m} = \underline{\hspace{1cm}} \text{ mm}$

h. $230 \text{ mm} = \underline{\hspace{1cm}} \text{ cm}$

i. $810 \text{ m} = \underline{\hspace{1cm}} \text{ km}$

j. $4.5 \text{ km} = \underline{\hspace{1cm}} \text{ cm}$

k. $0.2 \text{ m} = \underline{\hspace{1cm}} \text{ cm}$

l. $450 \text{ m} = \underline{\hspace{1cm}} \text{ cm}$

m. $300 \text{ cm} = \underline{\hspace{1cm}} \text{ m}$

n. $275 \text{ cm} = \underline{\hspace{1cm}} \text{ m}$

o. $2500 \text{ m} = \underline{\hspace{1cm}} \text{ km}$

p. $7.2 \text{ km} = \underline{\hspace{1cm}} \text{ m}$

q. $0.015 \text{ km} = \underline{\hspace{1cm}} \text{ m}$

r. $15 \text{ cm} = \underline{\hspace{1cm}} \text{ mm}$

s. $250 \text{ mm} = \underline{\hspace{1cm}} \text{ cm}$

t. $6500 \text{ mm} = \underline{\hspace{1cm}} \text{ cm}$

u. $515 \text{ cm} = \underline{\hspace{1cm}} \text{ m}$

v. $34 \text{ m} = \underline{\hspace{1cm}} \text{ cm}$

2. Change each of the following lengths to inches.

a. $3 \text{ feet} = \underline{\hspace{1cm}} \text{ inches}$

b. $2.5 \text{ yards} = \underline{\hspace{1cm}} \text{ inches}$

c. $1 \text{ mile} = \underline{\hspace{1cm}} \text{ inches}$

d. $8 \text{ feet and } 2 \text{ inches} = \underline{\hspace{1cm}} \text{ inches}$

3. Change each of the following lengths to feet.

a. $2.5 \text{ yards} = \underline{\hspace{1cm}} \text{ feet}$

b. $42 \text{ inches} = \underline{\hspace{1cm}} \text{ feet}$

c. $2.5 \text{ miles} = \underline{\hspace{1cm}} \text{ feet}$

d. $2 \text{ } 1 \text{ yards and } 3 \text{ feet} = \underline{\hspace{1cm}} \text{ feet}$

4. Change each of the following lengths to yards.

a. $12 \text{ feet} = \underline{\hspace{1cm}} \text{ yards}$

b. $72 \text{ inches} = \underline{\hspace{1cm}} \text{ yards}$

c. $3.5 \text{ miles} = \underline{\hspace{1cm}} \text{ yards}$

d. $10 \text{ feet and } 24 \text{ inches} = \underline{\hspace{1cm}} \text{ yards}$

5. Change each of the following lengths to miles.

a. $3520 \text{ yards} = \underline{\hspace{1cm}} \text{ miles}$

b. $15\,840 \text{ feet} = \underline{\hspace{1cm}} \text{ miles}$

6. The distance around a track is 440 yards. How many feet is this?

7. The water at the end of a pier is 3.2 m deep. How many centimetres deep is it?

8. The length of Sarah's back yard is 10.5 yards. How many inches long is it?

9. The height of a set of steps is 1.8 m. How many millimetres high is it?

10. It is 3.5 miles from Olivio's house to the shopping mall. How many yards away is the mall from his house?

11. The length of Mr. Chow's garden is 12 paces and the width is 5 paces. Each pace is 30 inches in length.
 - a. How many inches long is the garden?

 - b. How many feet wide is the garden?

 - c. How many yards long is the garden?

 - d. About what percent of the length is the width of the garden?

ANSWERS TO EXERCISES AND CHAPTER TESTS

CHAPTER 1**Exercises 1.2** (page 5)

1. a) (i) 8 (ii) 3 b) (i) 3 (ii) 1 c) (i) 5 (ii) 2
 2. a) (i) Length = 5, Width = 1, Height = 2
 (ii) Length = 2, Width = 0.5, Height = 1
 b) (i) Height = 4, Diameter = 3
 (ii) Height = 1.5, Diameter = 1 3. Draw a rectangular prism with given dimensions.
 4. Draw a cylinder with given dimensions.

Exercises 1.3 (page 10)

1. a) 3000 b) 500 c) 200 d) 0.3 e) 2 f) 0.5
 g) 25 000 h) 23 i) 0.81 j) 450 000 k) 20
 l) 45 000 m) 3 n) 2.75 o) 2.5 p) 7200
 q) 15 r) 150 s) 25 t) 650 u) 5.15 v) 3400
 2. a) 36 b) 90 c) 63 360 d) 98 3. a) 7.5
 b) 3.5 c) 13 200 d) 66 4. a) 4 b) 2 c) 6160
 d) 4 5. a) 2 b) 3 6. 1320 feet 7. 320 cm
 8. 378 inches 9. 1800 mm 10. 6160 yards
 11. a) 360 inches b) 12.5 feet c) 10 yards
 d) about 42%

Exercises 1.4 (page 14)

1. a) (i) metres (ii) feet b) (i) centimetres
 (ii) inches c) (i) kilometres (ii) miles
 d) (i) centimetres or millimetres (ii) inches
 e) (i) metres (ii) feet f) (i) metres (ii) feet
 g) (i) centimetres or metres (ii) inches or feet
 h) (i) kilometres (ii) miles i) (i) millimetres
 (ii) inches j) (i) centimetres (ii) inches
 k) (i) kilometres (ii) miles l) (i) kilometres
 (ii) miles 2. a) SI: $4 \times 3.5 = 14$ m
 Imperial: $4 \times 11.4 = 45.6$ ft.
 b) SI: $0.5 \times 3.5 = 1.75$ m
 Imperial: $0.5 \times 11.4 = 5.7$ ft.
 3. a) SI: $0.5 \times 1.7 = 0.85$ m
 Imperial: $0.5 \times 5.5 = 2.75$ ft.
 b) SI: $2.5 \times 1.7 = 4.25$ m
 Imperial: $2.5 \times 5.5 = 13.75$ ft.
 4. a) SI: $3 \times 2.5 = 7.5$ m
 Imperial: $3 \times 8.1 = 24.3$ ft.
 b) SI: $4.4 \times 2.5 = 11$ m
 Imperial: $4.4 \times 8.1 = 35.64$ ft.
 4. a) SI: $6 \times 2.5 = 15$ m
 Imperial: $6 \times 8.1 = 48.6$ ft.

Exercises 1.5 (page 18)

1. a) 15 b) 24 c) 18 inches d) 21 cm
 2. a) about 12.56 feet b) about 7.85 cm
 3. $(8.5 + 200) \times 2 = 417$ cm
 4. $(72 + 3) \times 2 = 150$ inches 5. 20.8 cm
 6. $(5 + 3.6) \times 2 = 17.2$ m
 7. $76.7 \times 12.5 = \$958.75$ 8. 1.8 cm
 9. $(8 \times 3.14) \times 6.50 = \163.28 10. 20 cm
 11. $2 \div 4 = 0.5$; $0.5 \times 36 = 18$ inches
 12. $132 \div 33 = 4$; 4 days
 13. $5(60 + 60 + 20 \times 3.14) = 5(182.8) = 914$ m
 14. 2.7 m 15. $2.4 \times 5 = 12$ inches
 16. $33 \div 6 = 5.5$ cm 17. $x + x + x + 3 = 39$
 $x = 12$; Longest side = 15 inches
 18. $2(40.5 + 16.5) \times 7.75 = \883.50

Exercises 1.6 (page 24)

1. a) 7.5 b) 28 c) 47.222... d) 375 e) 2.1
 2. 75 letters 3. 5880 patients 4. 50 teachers
 5. 90 bags 6. 21 adults 7. 56.25 hours
 8. 490 km

Exercises 1.7 (page 26)

1. a) 12.7 b) 10.922 c) 88.9 d) 31.75
 2. a) 5.85 b) 17.55 c) 2.925 d) 0.2925
 3. a) 9.66 b) 3.703 c) 241.5 d) 1.288
 4. a) 28.52 b) 93 c) 5.89 d) 0.465
 5. a) 0.156 b) 167.64 c) 640.08 d) 160 934.4
 e) 312 000 f) 97.5

Exercises 1.8 (page 28)

1. a) 19.5 b) 39.37 c) 43.4 d) 24.633
 e) 457.2 f) 1755 2. 88.55 3. 157.48
 4. \$28.67 5. 117 in., 9.75 feet 6. \$381
 7. 13.716 m

Chapter 1 Test (page 30)

1. (i) 8 cm, 3 cm (ii) 3 inches, 1 inch
 2. 3.1 cm 3. \$1026 4. a) 370 b) 3200 c) 0.5
 d) 0.75 e) 17 000 f) 1.25 5. a) 6 b) 432
 c) 26 400 d) 0.5 e) 225 f) 528 6. 8.845 km
 7. 9 ft or 3 yard 8. \$3135 9. 2.2 m
 10. 3.85 m 11. a) 2.025 b) 900
 12. 1200 cones 13. \$22.50 14. a) 127 b) 5.85
 c) 40.25 d) 930 e) 2.76 f) 1341.12 g) 6.1
 h) 1560 15. 381 cm 16. \$32



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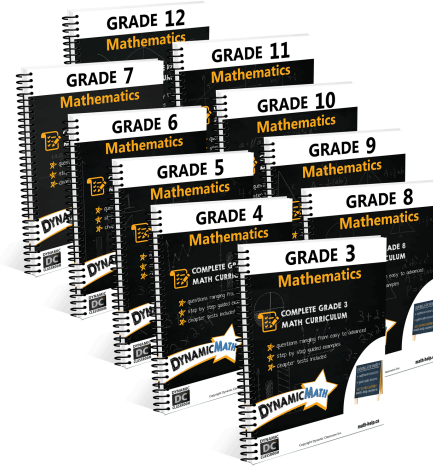
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