

Year 8 Term 3 Homework

Student Name: _____	Grade: _____
Date: _____	Score: _____

Table of contents

2	Year 8 Term 3 Week 2 Homework	1
2.1	Geometric Constructions	1
2.1.1	Constructing Parallel and Perpendicular Lines	1
2.2	Area and Volume	2
2.2.1	Area of Rectangles, Triangles and Quadrilaterals	2
2.2.2	Surface Area	5
2.3	Volume of Prisms	6
2.4	Miscellaneous Exercise	8
2.5	Math Challenge	11

This edition was printed on September 19, 2014.

Camera ready copy was prepared with the **L^AT_EX₂ ϵ** typesetting system.

Copyright © 2000 - 2014 Yimin Math Centre (www.yiminmathcentre.com)

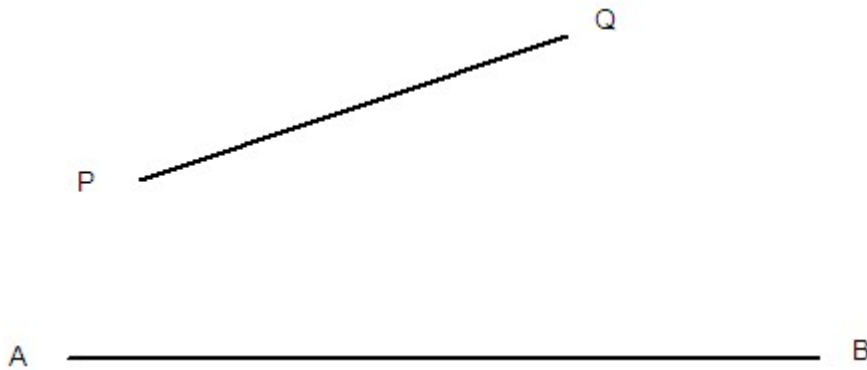
2 Year 8 Term 3 Week 2 Homework

2.1 Geometric Constructions

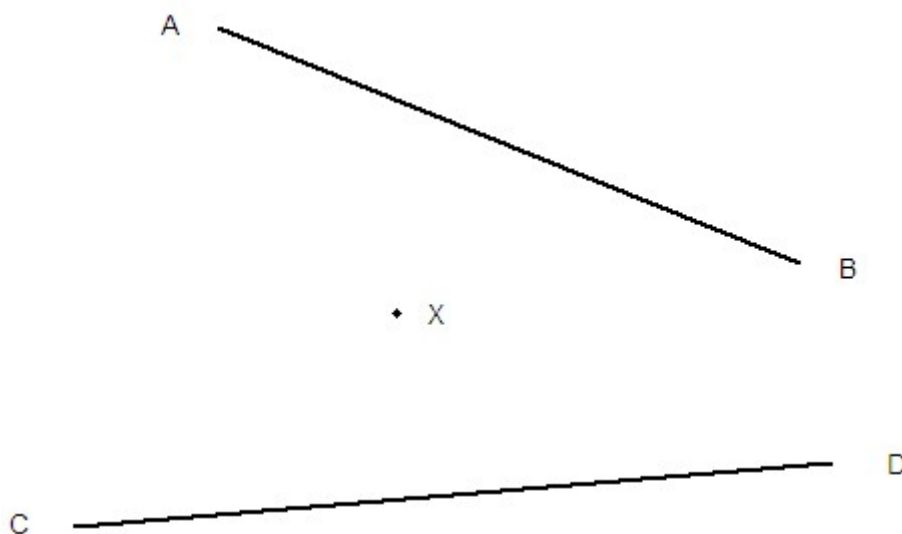
2.1.1 Constructing Parallel and Perpendicular Lines

Exercise 2.1.1

1. Find the midpoint M of PQ and hence construct a line that passes through the point M and is perpendicular to AB .



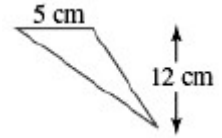
2. Construct a line that passes through the point x and is perpendicular to AB and another line that passes through the same point and is perpendicular to CD .



2.2 Area and Volume

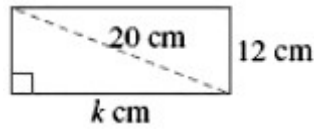
2.2.1 Area of Rectangles, Triangles and Quadrilaterals

Exercise 2.2.1 Find the area of each of these figures:

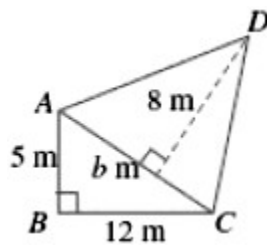


1. $A =$ _____

2. Find the value of k and hence calculate the area of the rectangle.

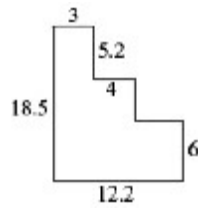


3. Find the value of b and hence calculate the total area of the quadrilateral ABCD.

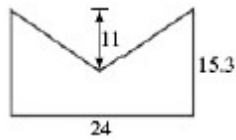


Exercise 2.2.2 Find the total area of each of these figures. All dimensions are in metres.

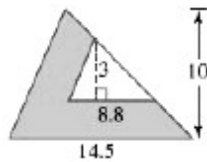
1. Total area = _____



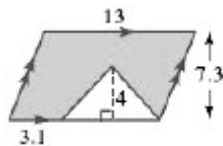
2. Total area = _____



3. Shaded area = _____

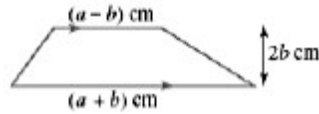


4. Shaded area = _____

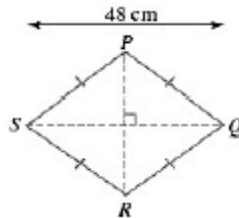


Exercise 2.2.3 Further applications

1. Find in simplest form, an algebraic expression for the area of this trapezium.



2. PQRS is a rhombus with a perimeter of 100 cm. The longer diagonal SQ has a length of 48 cm.

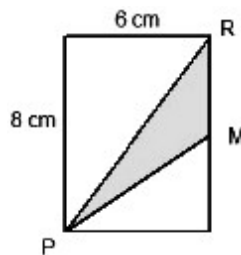


(a) Write down the side length of the rhombus. _____

(b) Use Pythagoras' Theorem to find the length of the shorter diagonal PR.

(c) Find the area of the rhombus.

3. M is the midpoint of the side of a rectangle. What is the area of the shaded triangle PMR?



2.2.2 Surface Area

Exercise 2.2.4

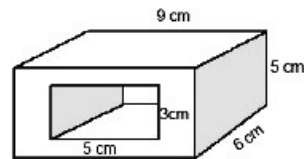
1. Mary put her Christmas presents in small boxes each measuring 12 cm by 10 cm by 8 cm, then wrapped the boxes using a 4 m² roll of paper.

(a) Express 4 m² in cm². _____

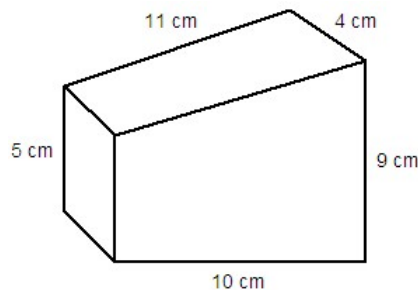
(b) What area of paper is needed to wrap each small box, allowing for an overlap of 100 cm²?

(c) How many boxes could be covered with one roll of wrapped paper?

2. Find the total surface area of the following figure:



3. Find the total surface area of the following figure:

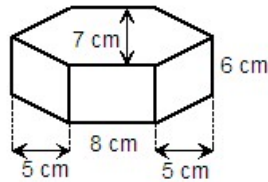


2.3 Volume of Prisms

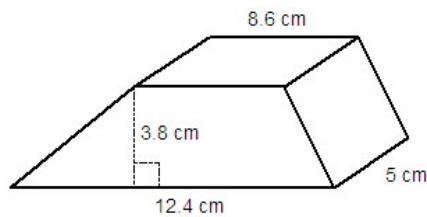
Exercise 2.3.1

1. Find the volume of each prism:

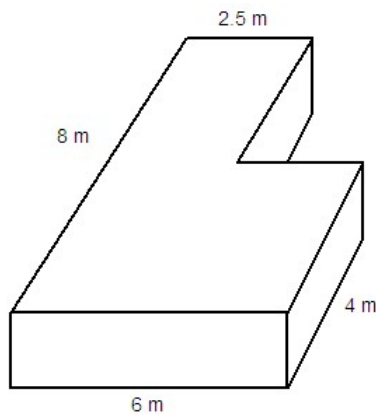
(a) Volume = _____



(b) Volume = _____

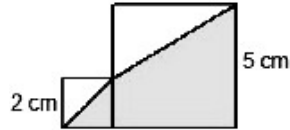


2. John is constructing an L-shaped swimming pool as shown in figure below. If the pool is to hold 71.4 m^3 of water, how deep will the pool need to be?

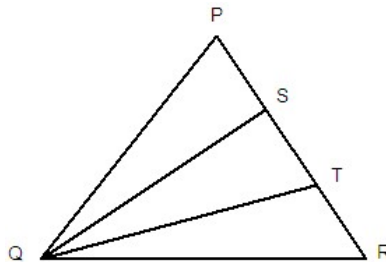


Exercise 2.3.2 Problem Solving

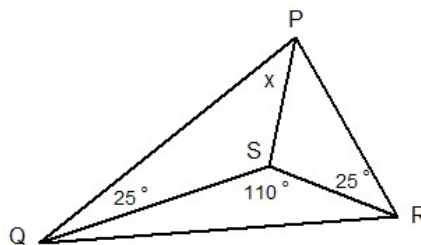
1. A square with side length 2 cm is placed next to a square with side length 5 cm as shown. Find the shaded area of the figure.



2. $\triangle PQR$ is an equilateral triangle, QS and QT divide $\angle PQR$ into three equal parts. Find the size of $\angle QTS$ in degrees.



3. S is a point inside $\triangle PQR$ such that $SP = SR$. The size of some of the angles are as given below. Find the angle x .



2.4 Miscellaneous Exercise**Exercise 2.4.1 Solve the following equations:**

1. $5x + 4 = 2x - 17$

2. $3(2x - 3) = 4(3x + 4) - x$

3. $\frac{1}{2}(x - 3) = 3(x + 2)$

4. $\frac{x+3}{3} = \frac{x-4}{4}$

5. $\frac{x+5}{3} - \frac{2x-1}{4} = \frac{3}{4}$

6. $\frac{2(x-1)}{3} + \frac{3(2x+1)}{2} = \frac{x+2}{6}$

Exercise 2.4.2 Solve the following inequations:

1. $4x + 3 > 2x - 15$

2. $2x + 3 \leq 4x - 15$

3. $2(x - 3) \geq 3(2x - 1) + 1$

4. $\frac{2x-1}{3} > \frac{3x+1}{4}$

5. $2 < 3x - 1 < 5$

6. $3 < 3 - 2x \leq 15$

Exercise 2.4.3 Solve the following simultaneous equations:

1.
$$\begin{cases} 3x + 4y = 25 \\ 4x - 2y = 4 \end{cases}$$

2.
$$\begin{cases} \frac{x}{4} + \frac{y}{3} = 4 \\ \frac{x}{2} - \frac{y}{2} = 1 \end{cases}$$

Exercise 2.4.4 compare the following expressions:

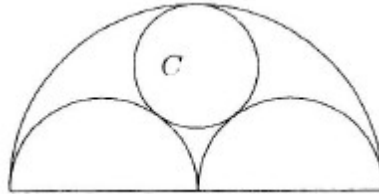
1. 3^{300} and 2^{400}

2. $4 + \sqrt{3}$ and $7 - \sqrt{3}$

2.5 Math Challenge

Exercise 2.5.1

- Two semicircles of radius 1 cm are drawn on the diameter of a semicircle of radius 2 cm. A circle C touches all three semicircles as shown below. Of the radius of the circle C is $\frac{a}{b}$ where a and b are integers with no common factors, find the sum of a and b .



- The total amount of water in tank A, tank B and tank C was 290 L. David poured out half the water from tank A, doubled the amount of water in tank B and added 30 L of water into tank C. The ratio of the amount of water in tank A to tank B to tank C is now 3:2:1. Find the amount of water in the 3 tanks now.
