Year 9 Yearly 2011

(TIME: 75 MINUTES)
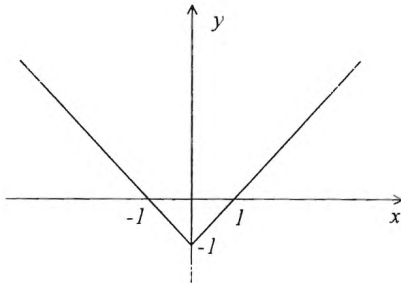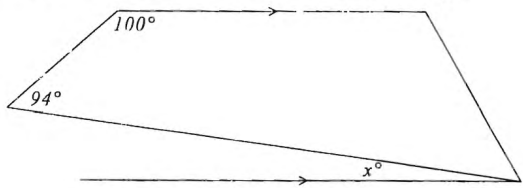
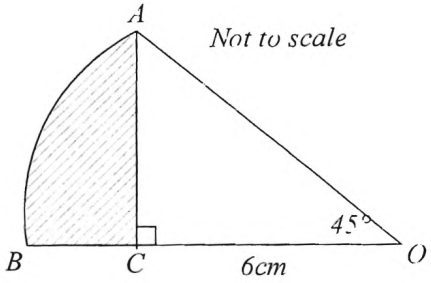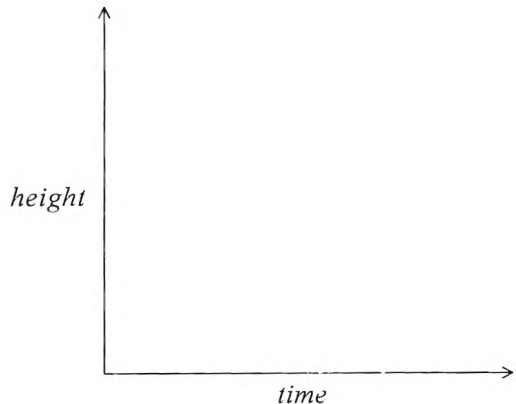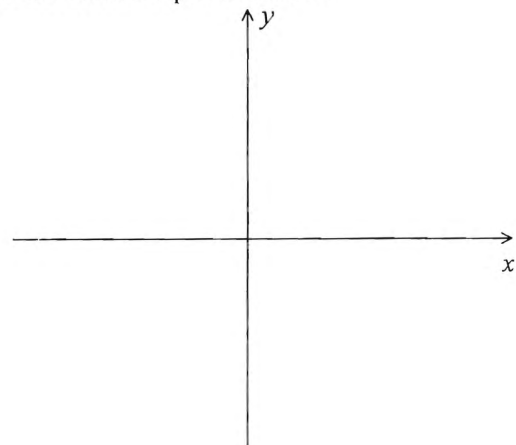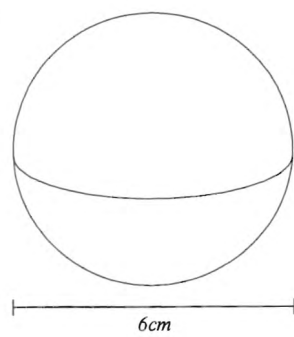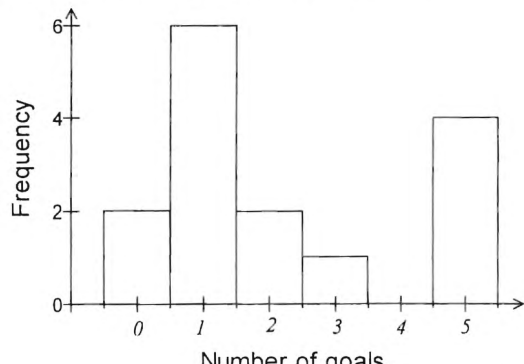| Name:	Teacher:

Directions
- Full working should be shown in every question. Marks may be deducted for careless or badly arranged work.
- Use black or blue pen only (not pencils) to write your solutions.
- No liquid paper is to be used. If a correction is to be made, one line is to be ruled through the incorrect answer.
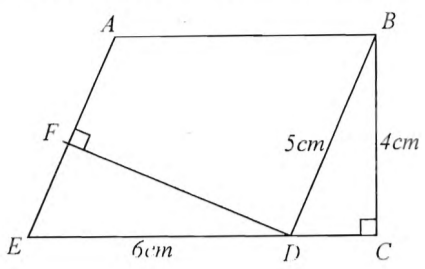- The diagrams are not to scale.
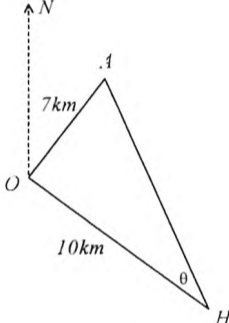
Part A
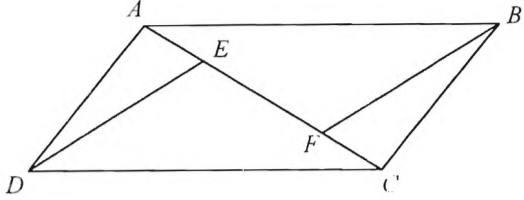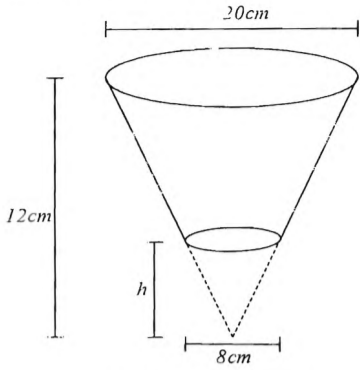
1. Evaluate $\frac{\sqrt{13.4}+21.3}{3.5^2}$ to 3 significant figures. **1**

2. Find the midpoint between the points $(-2,3)$ and $(4,8)$. **1**

3. A television valued at $1240 is discounted to $744. What is the percentage discount? **1**

4. Solve $6 - \frac{3-x}{5} = -4$ **1**

5. Write 24 million in scientific notation. **1**

6. Express $4a^{-\frac{1}{2}}$ without a fractional index. **1**

7. Expand and simplify $\left(2\sqrt{3} - 1\right)^2$. **1**

8. Simplify $3^x \times 3^x$. **1**

9. What is the equation of the graph below. **2**

10. Find the value of x in the following. **1**

11. Solve $7x = x^2$. **2**

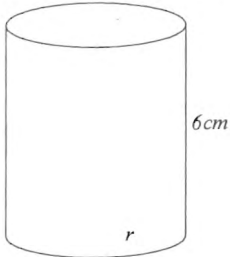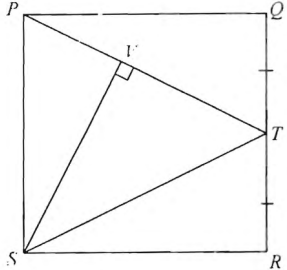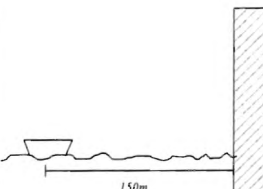|				
12.	What is the gradient between the points $(-1, 3)$ and $(8, 9)$? **1**		17.	What is the exact value of $\tan 30°$? **1**
13.	Simplify $\dfrac{4a - 6b}{4a^2 - 9b^2}$. **1**		18.	Consider the scores 6,4,3,8,5,9,9,10. What score must be added so the range of the scores is equal to the mode? **1**
14.	Name a quadrilateral with unequal diagonals which has 2 axes of symmetry. **1**		19.	If $2^k = a$ then express 4^{k-2} in terms of a. **1**
15.	The rate of fuel consumption for a car is $9.2l/100km$. How much fuel is used on a journey of $460\ km$? **1**			
			20.	OAB is a sector where $OC = 6cm$. Find the value of the shaded area. **2**
16.	Sketch the graph of $y = (x - 2)^2$. **2**			

16 graph

$$\uparrow y$$

$$\longrightarrow x$$

20 figure

A

Not to scale

B *C* *6cm* *45°* *O*

	Part B	
1.	Rationalise the denominator in the following. $$\frac{1}{3\sqrt{2}}$$	**1**
2.	Solve simultaneously $$2x + 3y = 10$$ $$2x - y = 2$$	**2**
3.	Solve $x^2 + 5x + 3 = 0$	**2**
4.	**(i)** Find the volume of a sphere with a diameter of 6 centimetres. 6cm	**1**

(ii) The empty sphere is filled with water at a constant rate. Draw the graph on the axes below to show how the depth of the water level changes with time. **1**

5. **(i)** Sketch the graph of the line $2x + y = 6$ on the number plane below. **1**

(ii) Hence shade the region defined by $2x + y \leq 6$. **1**

6. Below is a histogram of the number of goals scored in a season by a hockey team.

What is the mean number of goals scored by the hockey team in the season? **1**
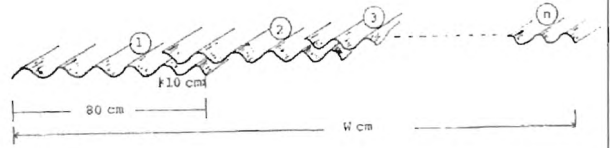
7. If $sin\theta = \frac{5}{7}$ find the exact value of $tan\theta$. **2**

8. The speed (s) of a truck down a decline varies directly as the square root of its mass (m). A truck of mass 4 tonnes has a speed of $60\ km/hr$.

    a) Write an equation to represent the relationship between s and m **1**

    b) Find the constant of variation (k) **1**

    c) What is the mass of a truck whose speed is $90 km/hr$? **1**

9. What is the equation of the line through $(2, -1)$ perpendicular to the line $y = 3x - 6$? Give your answer in general form. **3**

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10. ABCE is a trapezium and ABDE is a parallelogram. BC = 4cm, BD = 5 and DE = 6 cm. Find the length of DF. **2**

Part C

1.

Hayden and Archie leave point O. Archie walks for 7 km on a bearing of 047°, to point A. Hayden walks for 10 km to point H such that $\angle AOH$ =90°.

(i) What bearing did Hayden take on his walk from O. **1**

(ii) Find $\angle OHA$. **2**

(iii) What is the bearing from Hayden to Archie? **1**

2. ABCD is a parallelogram and AF = EC.
Prove that $\triangle AED \equiv \triangle BFC$ **3**

3. A car valued at $34000 is purchased on terms. A deposit of 10% is paid.

The balance and interest is repaid over 5 years in equal monthly instalments of $739.50.

(i) Find the deposit paid. **1**

(ii) Find the interest paid for the car. **2**

(iii) What is the rate of interest charged per annum for the car loan ? **2**

4. The solid below is of a cone which has been cut off parallel to its base.

(a) Show that the height, h of the cut off cone is $4.8cm$. **2**

(b) Hence find the volume of the solid. **2**

5. Factorise $a^4 + a^2b^2 + b^4$. **1**

6. (a) What is the formula for the surface area of a cylinder? **1**

(b) The surface area of the closed cylinder below is $32\pi \ cm^2$.
Find the radius of the cylinder if the height of the cylinder is $6 \ cm$. **3**

6cm

r

Multiple Choice

1. $\sqrt{50} + \sqrt{75} =$
(A) $5\sqrt{5}$ (B) $10\sqrt{5}$
(C) $25\sqrt{2} + 25\sqrt{3}$ (D) $5\sqrt{2} + 5\sqrt{3}$

2. There are twenty seven times as many cars in Australia as motorcycles. C stands for the number of cars and M for the number of motor cycles. Which equation correctly describes the relationship between the number of cars and motorcycles?

(A) $M = 27C$ (B) $C = \frac{27}{M}$

(C) $C = 27M$ (D) $M = \frac{27}{C}$

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3. Simplify $4(2x - 1) - 3(x - 3) =$

(A) $5x + 2$ (B) $5x - 4$
(C) $5x + 5$ (D) $5x - 13$

4. PQRS is a square. T is the midpoint of QR.
SV is perpendicular to PT.
Which two triangles are congruent?

(A) PVS and SVT   (B) SVT and SRT
(C) PQT and SRT   (D) PVS and PQT.

5. The equation $4x - 3y = 12$ is equivalent to

(A) $y = \frac{4x}{3} + 4$ (B) $y = \frac{4x}{3} - 4$
(C) $y = \frac{-4x}{3} + 4$ (D) $y = \frac{-4x}{3} - 4$

6.

A boat is 150 metres from the base of a cliff. The angle of depression of the boat from the top of the cliff is 23°.

150m

The height of the cliff to the nearest metre is:

(A) 59   (B) 64
(C) 138   (D) 353

7. Which of the following is a factor of
$6x^2 + x - 35$?

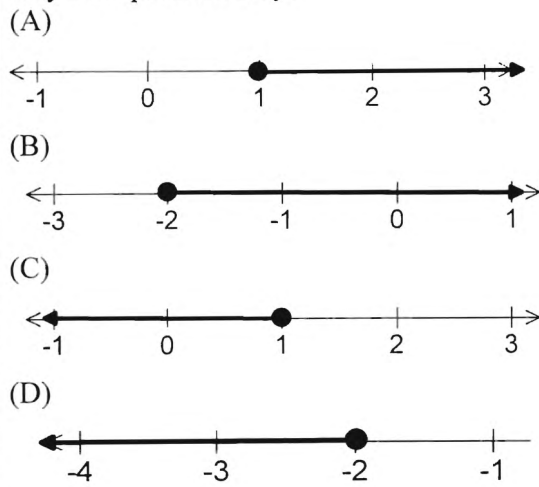(A) $3x - 7$ (B) $3x - 5$

(C) $3x + 5$ (D) $3x + 7$

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8. The solution of the inequality $3 - 2x \leq 1$ may be represented by:

(A)

(B)

(C)

(D)

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9. Which of the lines drawn below represent line $y = 4 - 2x$?

(A)   (B)

(C)   (D)

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10. Roofing sheets are $80cm$ wide, and are placed so that each sheet overlaps the preceding sheet by $10cm$.

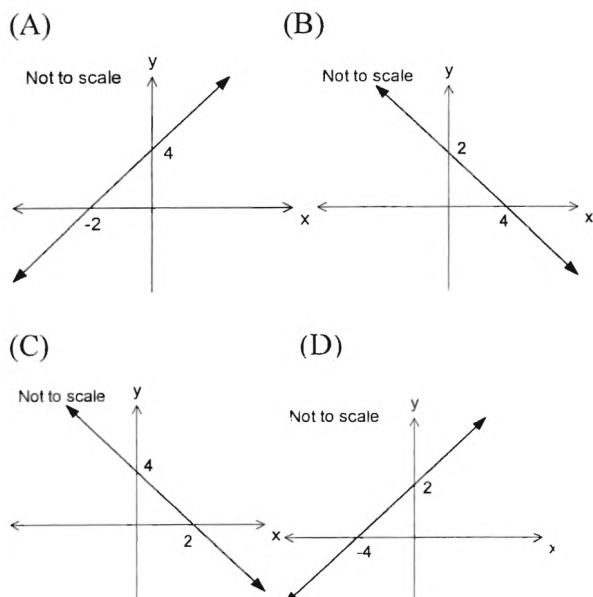If n sheets are laid, what is the width(W) in centimetres of the covered roof?

(A) $70n$ (B) $70n + 10$
(C) $80n$ (D) $80n - 10$

Spare working space

End of Exam