

ELGIN ACADEMY

Prelim Examination 2007 / 2008

MATHEMATICS Standard Grade - Credit Level

Paper 1

Time allowed - 55 minutes

Read Carefully

1. Answer as many questions as you can.
2. Full credit will be given only where the solution contains appropriate working.
3. **You may not use a calculator**

FORMULAE LIST

The roots of $ax^2 + bx + c = 0$ are: $x = \frac{-b \pm \sqrt{(b^2 - 4ac)}}{2a}$

Sine rule: $\frac{a}{\sin A} = \frac{b}{\sin B} = \frac{c}{\sin C}$

Cosine rule: $a^2 = b^2 + c^2 - 2bc \cos A$ or $\cos A = \frac{b^2 + c^2 - a^2}{2bc}$

Area of a triangle: $\text{Area} = \frac{1}{2}ab \sin C$

Standard Deviation: $s = \sqrt{\frac{\sum (x - \bar{x})^2}{n - 1}} = \sqrt{\frac{\sum x^2 - \frac{(\sum x)^2}{n}}{n - 1}}$

KU	RE
2	
3	
3	
4	
3	
3	

1. Evaluate $5 \cdot 9 - 6 \cdot 3 \div 5$

2.
$$x = \frac{3(y+2)}{5}$$

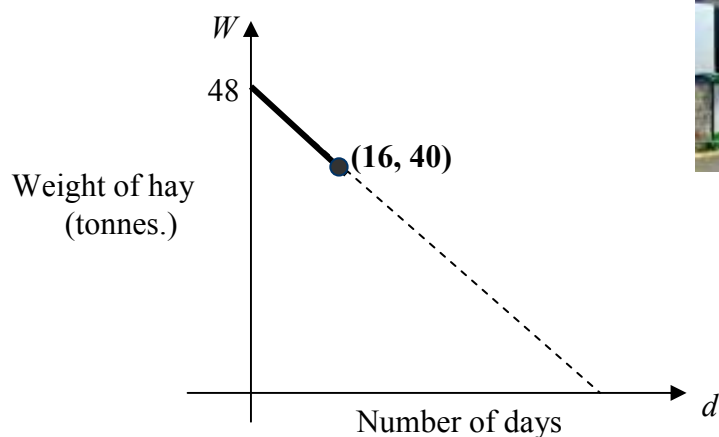
Change the subject of the formula to y .

3. Evaluate

$$2\frac{1}{3} + \frac{4}{5} \text{ of } 1\frac{3}{7}$$

4. Solve the inequality, $12 - (x + 2) \geq 1 + x$ where x is a **whole number**.

5. The local riding stables buy in 48 tonnes of hay to feed the horses during the winter season, which lasts for 93 days. After 16 days they have 40 tonnes of hay left. The graph below illustrates the situation.

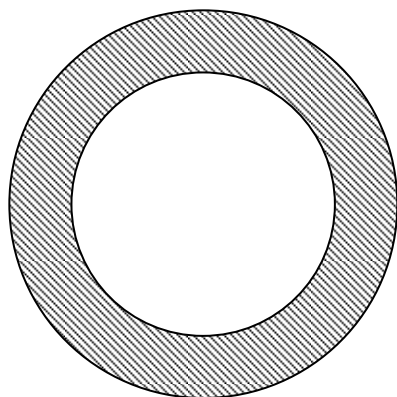


(a) Find the equation of the line shown above.

(b) If the horses continue to consume the hay at this rate, will it last to the end of the winter season?

KU	RE
	4
2	
	2
	3

6. The shaded area between the two concentric circles shown below is S square centimetres.



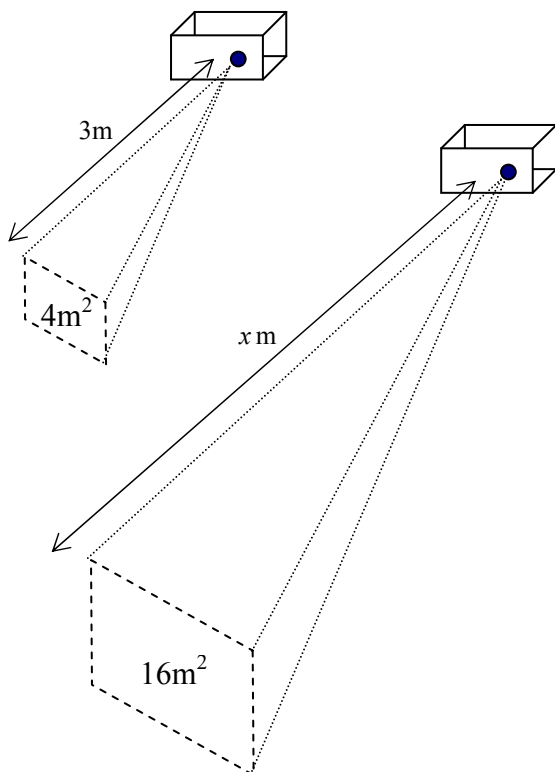
The radius of the larger circle is **3.5cm** and the radius of the smaller circle is **2.5cm**.

Find the value of S in terms of π .

7. (a) Factorise $2x^2 + 3x - 5$

(b) Hence, or otherwise, factorise $2(x-3)^2 + 3(x-3) - 5$, leaving your answer in its simplest form.

8.



A projector positioned 3 metres from a screen produces a rectangular image of 4 square metres.

The projector is moved further back, as shown, and the rectangular image now produced is 16 square metres.

Calculate how far the projector is from the image now.
(i.e. the distance x m in the diagram)

