

ELGIN ACADEMY

Prelim Examination 2006 / 2007

MATHEMATICS Standard Grade - Credit Level

Paper I

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: 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	
2	
2	
3	
3	
3	
3	

1. Evaluate $7 \cdot 5 + 1 \cdot 9 \times 4$

2. Work out the answer to $3 - \left(\frac{1}{5} + \frac{2}{3}\right)$

3. $f(x) = 13 - x^2$

(a) Find $f(-5)$.

(b) If $f(a) = 4$, find the possible value(s) for a .

4. Solve the equation

$$2x - 4(x - 3) = -8$$

5. Coffee is on special offer at the local supermarket.
Each tin on special offer contains 20% more coffee than the normal jar.

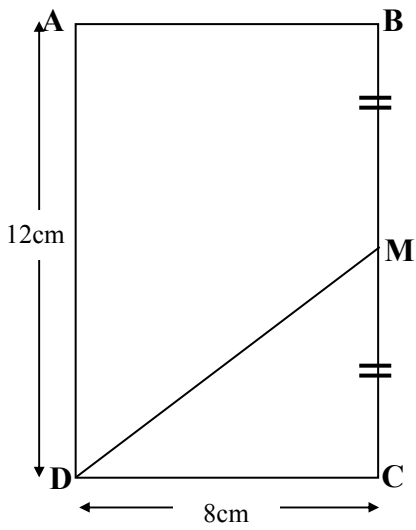


A tin on special offer contains 720g of coffee.

How much coffee does the normal jar hold?

KU	RE
	4
	4
	2
	3

6. **ABCD** is a rectangle measuring 8cm by 12cm. **M** is the midpoint of side **BC** as shown in the diagram below.



Calculate the length of **DM**.

7. Given that $x * y = x + y + 2xy$, find the **values** of a for which

$$(a * a) = 7(a + 1)$$

8. A survey was carried out amongst 400 adults who booked a holiday on-line to find out what type of holiday they had chosen.

The results of the survey are shown in the table below.

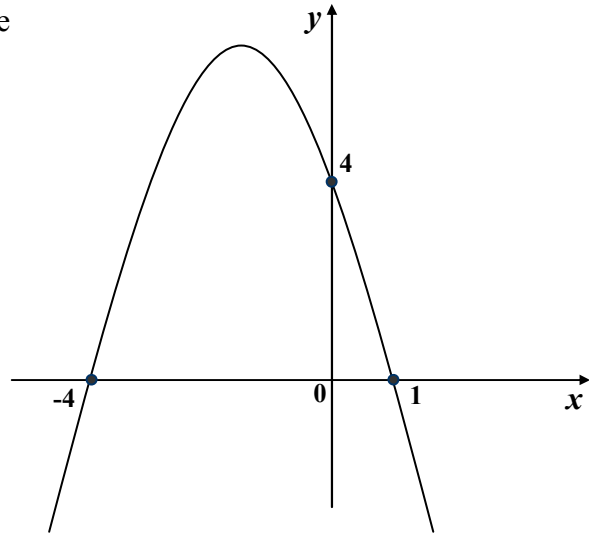
Age	Package	Activity	Fly drive	Cruise
40 and under	92	86	18	14
Over 40	45	38	21	86

What is the probability that any adult, chosen at random, would have booked a cruise?
Give your answer in its simplest terms.

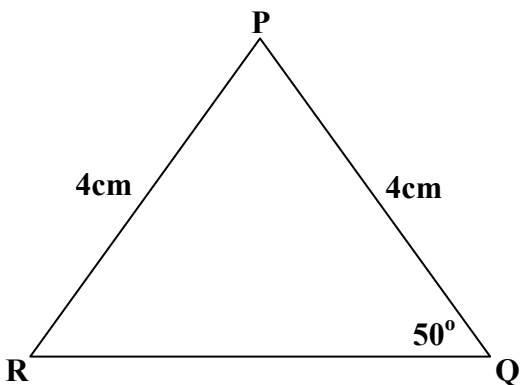
9. Given that $T \propto \frac{A}{n}$ and $T = 3$ when $A = 15$ and $n = 10$, find n when $A = 12$ and $T = 4$.

KU	RE
	4
	4

10. Determine the equation of the parabola in the diagram which passes through the points $(-4, 0)$, $(1, 0)$ and $(0, 4)$



- 11.



Isosceles triangle **PQR** is shown opposite.

Show that the length of **RQ** can be given by the expression

$$RQ = \sqrt{32(1 - \cos 80^\circ)} \text{ cm.}$$

[END OF QUESTION PAPER]