GCSE Grade 7

Maths Booklet 6

Paper 1H
Non-Calculator

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1 Solve $\frac{x+2}{3x} + \frac{x-2}{2x} = 3$

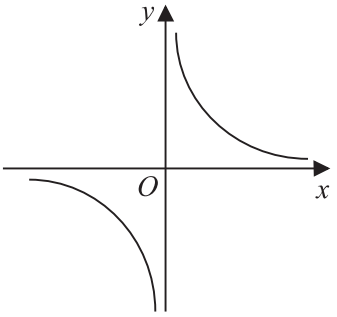
$x =$ .....

(Total for Question 1 is 3 marks)

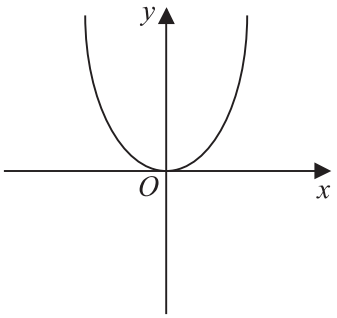
2 Show that $\frac{2x^2 - 3x - 5}{x^2 + 6x + 5}$ can be written in the form $\frac{ax + b}{cx + d}$ where a, b, c and d are integers.

(Total for Question 2 is 3 marks)

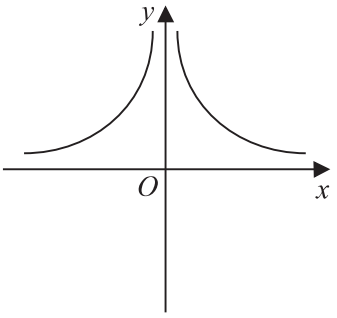
3 These graphs show four different proportionality relationships between y and x.



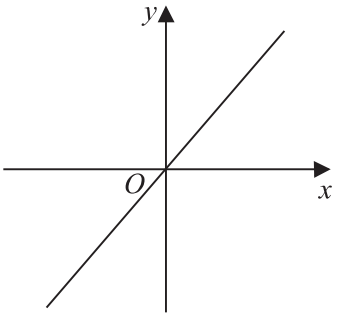
Graph A



Graph B



Graph C



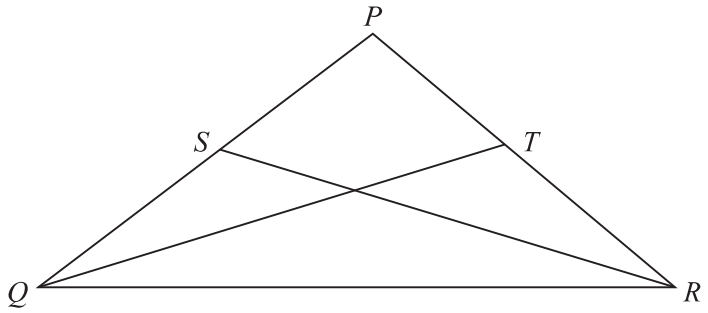
Graph D

Match each graph with a statement in the table below.

Proportionality relationship	**Graph letter**
y is directly proportional to x	
y is inversely proportional to x	
y is proportional to the square of x	
y is inversely proportional to the square of x	

(Total for Question 3 is 2 marks)

4

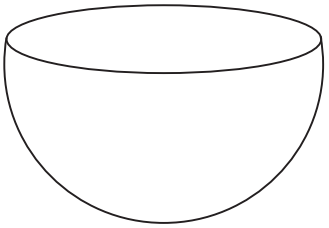


$PQ = PR$.
S is the midpoint of PQ.
T is the midpoint of PR.

Prove triangle QTR is congruent to triangle RSQ.

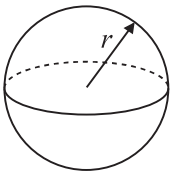
(Total for Question 4 is 3 marks)

5 The diagram shows a solid hemisphere.



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

Surface area of sphere = $4\pi r^2$



The volume of the hemisphere is $\frac{250}{3}\pi$

Work out the exact total surface area of the solid hemisphere.
Give your answer as a multiple of π.

..... cm^2

(Total for Question 5 is 4 marks)

6 (a) Write $\frac{5}{x+1} + \frac{2}{3x}$ as a single fraction in its simplest form.

.....

(2)

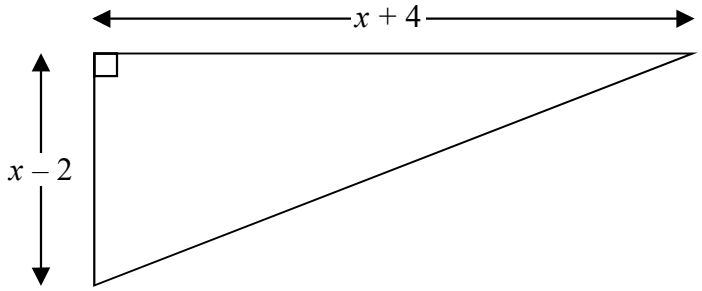
(b) Factorise $(x + y)^2 + 3(x + y)$

.....

(1)

(Total for Question 6 is 3 marks)

7 The diagram shows a right-angled triangle.



All the measurements are in centimetres.

The area of the triangle is 27.5 cm^2

Work out the length of the shortest side of the triangle.
You must show all your working.

..... cm

(Total for Question 7 is 4 marks)

8 Express $0.4\dot{1}\dot{8}$ as a fraction.
You must show all your working.

.....

(Total for Question 8 is 3 marks)

9 (a) Rationalise the denominator of $\frac{22}{\sqrt{11}}$

Give your answer in its simplest form.

.....

(2)

(b) Show that $\frac{\sqrt{3}}{2\sqrt{3}-1}$ can be written in the form $\frac{a+\sqrt{3}}{b}$ where a and b are integers.

(3)

(Total for Question 9 is 5 marks)

10 (a) Find the value of $\sqrt[3]{8 \times 10^6}$

.....

(1)

(b) Find the value of $144^{\frac{1}{2}} \times 64^{-\frac{1}{3}}$

.....

(2)

(c) Solve $3^{2x} = \frac{1}{81}$

$x =$ .....

(2)

(Total for Question 10 is 5 marks)

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11 The probability that Sanay is late for school tomorrow is 0.05
The probability that Jaden is late for school tomorrow is 0.15

Alfie says that the probability that Sanay and Jaden will both be late for school tomorrow is 0.0075 because $0.05 \times 0.15 = 0.0075$

What assumption has Alfie made?

.....

.....

(Total for Question 11 is 1 mark)
