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0607/21

May/June 2015

45 minutes

Additional Materials: Geometrical Instruments

READ THESE INSTRUCTIONS FIRST

DO **NOT** WRITE IN ANY BARCODES.

CALCULATORS MUST NOT BE USED IN THIS PAPER.

The total number of marks for this paper is 40.

This document consists of **8** printed pages.

Formula List

For the equation $ax^2 + bx + c = 0$ $x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$

Curved surface area, A , of cylinder of radius r , height h . $A = 2\pi rh$

Curved surface area, A , of cone of radius r , sloping edge l . $A = \pi rl$

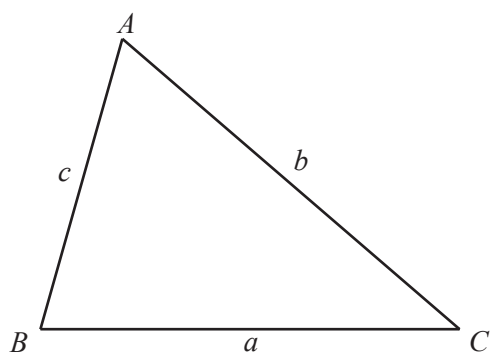
Curved surface area, A , of sphere of radius r . $A = 4\pi r^2$

Volume, V , of pyramid, base area A , height h . $V = \frac{1}{3}Ah$

Volume, V , of cylinder of radius r , height h . $V = \pi r^2 h$

Volume, V , of cone of radius r , height h . $V = \frac{1}{3}\pi r^2 h$

Volume, V , of sphere of radius r . $V = \frac{4}{3}\pi r^3$



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

$$a^2 = b^2 + c^2 - 2bc \cos A$$

$$\text{Area} = \frac{1}{2}bc \sin A$$

Answer **all** the questions.

- 1 (a) Write 4725.6 correct to two significant figures.

Answer(a) [1]

- (b) Write 0.01026 correct to three decimal places.

Answer(b) [1]

- 2 Expand and simplify.

(a) $-3x(2 - x) - (3x^2 - 7)$

Answer(a) [2]

(b) $(5x - 3y)(2y - 5x)$

Answer(b) [3]

- 3 Find the exact value of $27^{-\frac{1}{3}}$.

Answer [2]

- 4 Simplify $(16x^8y^2)^{\frac{1}{2}}$.

Answer [2]

- 5 (a) Simplify.

$$\sqrt{27} + \sqrt{147}$$

Answer(a) [2]

- (b) Rationalise the denominator.

$$\frac{3 - \sqrt{5}}{3 + \sqrt{5}}$$

Answer(b) [3]

6 Solve.

$$\log x + \log 5 - \log 25 = \log 10$$

Answer $x =$ [3]

7 There are 400 students at a school.

$\frac{2}{5}$ of the students are boys.

70% of the girls can swim.

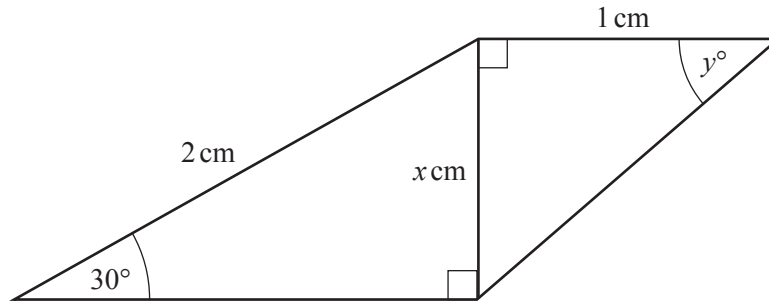
The ratio of boys that **cannot** swim to girls that **cannot** swim is 2 : 3.

Complete the table.

	Boys	Girls	Total
Can swim			
Cannot swim			
Total			400

[4]

8

NOT TO
SCALE

- (a) Write down the value of x .

Answer(a) $x =$ [1]

- (b) Find the value of y .

Answer(b) $y =$ [2]

9

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

- (a) Find $f(4)$.

Answer(a) [1]

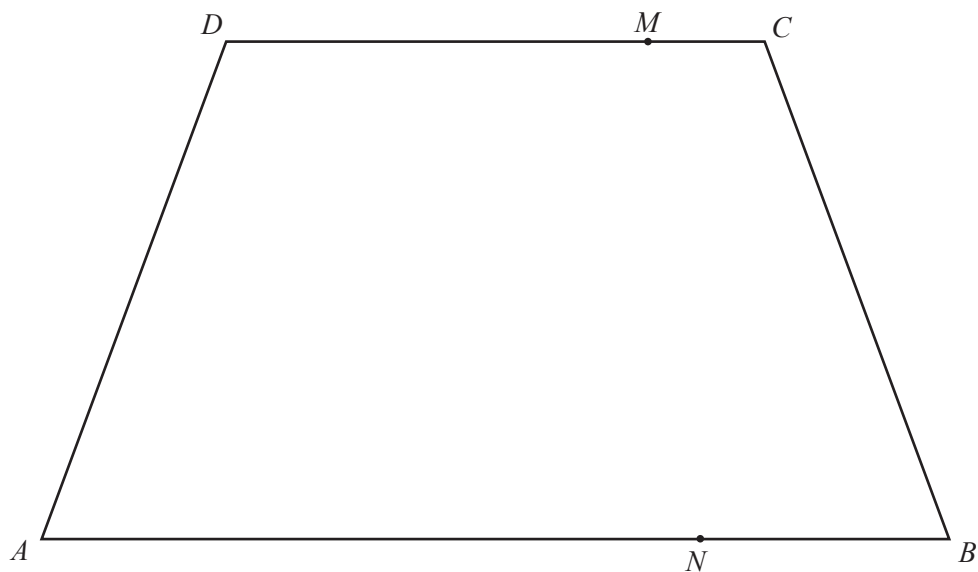
- (b) Solve $f(x) = \frac{1}{4}$.

Answer(b) [2]

- (c) Find $f^{-1}(x)$.

Answer(c) [3]

10

NOT TO
SCALE

$ABCD$ is a trapezium.

$AB = 2DC$, $DM = 2MC$ and $AN = 3NB$.

$\vec{AB} = \mathbf{p}$ and $\vec{AD} = \mathbf{q}$.

(a) Write $\vec{MC}$ in terms of $\mathbf{p}$.

Answer(a) [2]

(b) Find $\vec{MN}$ in terms of $\mathbf{p}$ and $\mathbf{q}$.

Answer(b) [2]

Question 11 is printed on the next page.

- 11 The point A has co-ordinates $(2, 8)$ and the point B has co-ordinates $(6, 6)$.

Find the equation of the perpendicular bisector of the line AB .

Answer [4]

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