Monster Questions – Set 4

Question 1

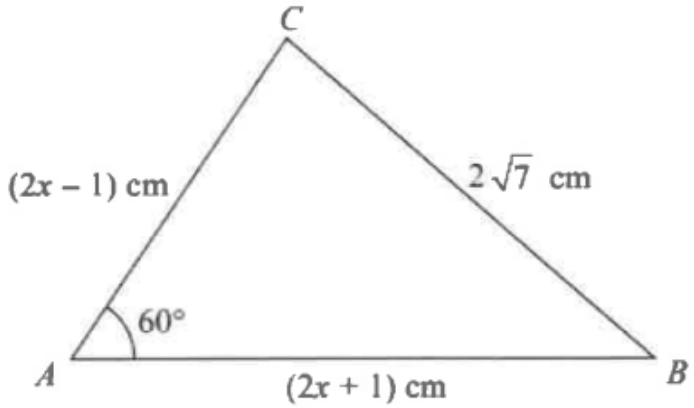


Diagram **NOT** accurately drawn

The diagram shows a triangle ABC.
$AB = (2x + 1)$ cm, $AC = (2x - 1)$ cm and $BC = 2\sqrt{7}$ cm.
Angle $BAC = 60°$

Work out the value of x.
Show clear algebraic working.

Question 2

PQRS and *PLMN* are similar quadrilaterals.

PN = 12 cm, *NS* = 8 cm, *PL* = 9 cm and *RS* = 13.5 cm.

LM is parallel to *QR* and *MN* is parallel to *RS*.

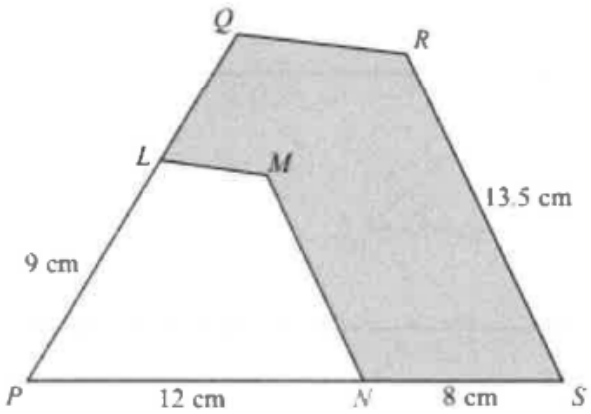


Diagram **NOT** accurately drawn

(a) Work out the length of *MN*.

_____ cm

(2)

(b) Work out the length of *LQ*.

_____ cm

(2)

The area of *PLMN* is A cm^2
The area of *PQRS* is kA cm^2

(c) Find the value of k.

The area of the shaded region is 105.6 cm^2

(d) Work out the value of A.

Question 3

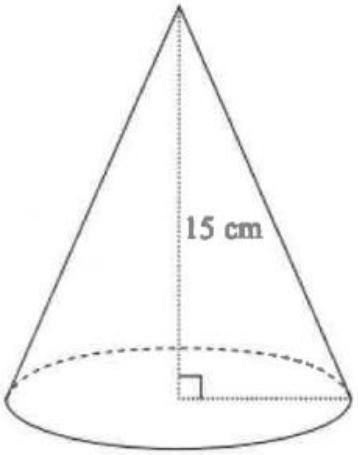


Diagram **NOT** accurately drawn

A solid cone has a height of 15 cm.
The volume of the cone is 320π cm^3

Work out the curved surface area of the cone.
Give your answer correct to 3 significant figures.

Question 4

$f: x \mapsto 2x^2 + 1 \quad g: x \mapsto \dfrac{2x}{x-1}$ where $x \neq 1$

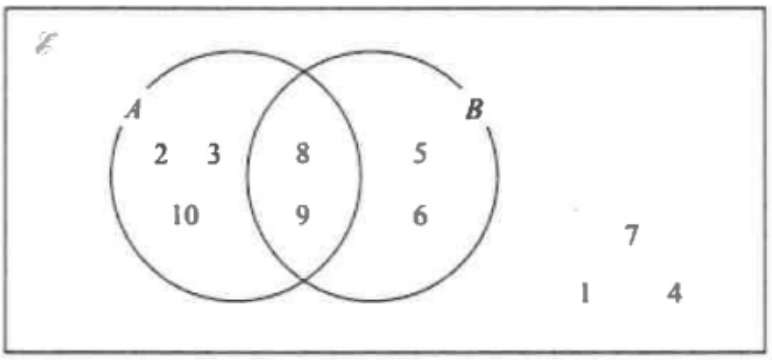
(a) Express the composite function gf in the form $gf: x \mapsto \ldots$
Give your answer as simply as possible.

$gf: x \mapsto$ .....

(2)

(b) Express the inverse function g^{-1} in the form $g^{-1}: x \mapsto \ldots$

Question 5



The Venn diagram shows all of the elements in sets A, B and $\mathscr{E}$.

(a) Write down the elements in A'

(1)

(b) Find $n(A \cap B)'$

(1)

(c) Find the elements in $(A \cap B) \cup (A \cup B)'$

(1)

$A \cap C = \emptyset$
$B \cup C = \{5, 6, 7, 8, 9\}$
$n(C) = 3$

(d) Write down the elements in C.