Monster Questions – Set 1

QUESTION 1

The diagram shows a circular pond, of radius r metres, surrounded by a circular path.
The circular path has a constant width of 1.5 metres.

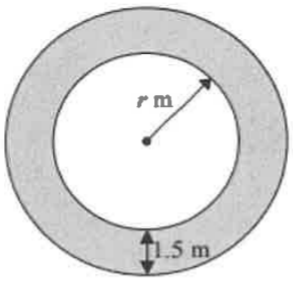

Diagram **NOT** accurately drawn

The area of the path is $\frac{1}{10}$ the area of the pond.

(a) Show that $2r^2 - 60r - 45 = 0$

(b) Calculate the area of the pond.
Show your working clearly.
Give your answer correct to 3 significant figures.

QUESTION 2

Correct to 2 significant figures, $a = 58$, $b = 28$ and $c = 18$

Calculate the upper bound for the value of $\frac{a}{b-c}$

Show your working clearly.

QUESTION 3

Two bags contain discs.

Bag A contains 12 discs.
5 of the discs are red, 6 are blue and 1 is white.

Bag B contains 25 discs.
n of the discs are red and the rest are blue.

James takes at random a disc from Bag A.
Lucy takes at random a disc from Bag B.

Given that the probability that James and Lucy both take a red disc is $\frac{2}{15}$

(i) find the value of n, the number of red discs in Bag B.

$n =$ .....

(ii) Hence calculate the probability that James and Lucy take discs of different colours.

QUESTION 4

ABCD is a kite.

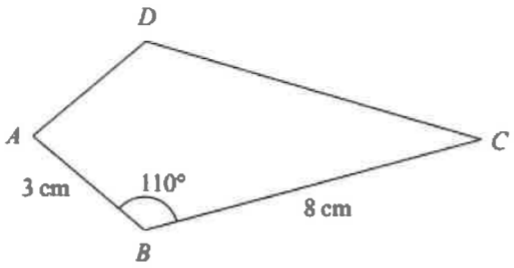

Diagram **NOT** accurately drawn

$AB = 3$ cm
$BC = 8$ cm
Angle $ABC = 110°$

Calculate the area of the kite *ABCD*.
Give your answer correct to 3 significant figures.

QUESTION 5

Solve $x^2 + y^2 = 20$
$y = 10 - 2x$

Show clear algebraic working.