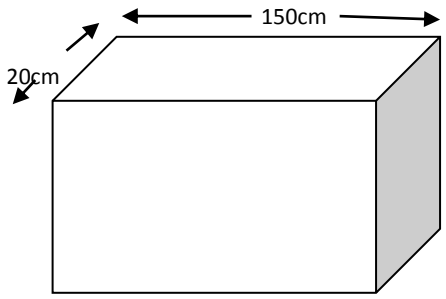
MUCHINGA JETS FAIR, 2014

JUNIOR MATHEMATICS OLYMPIADS

ANSWER ALL QUESTIONS

QUESTION ONE

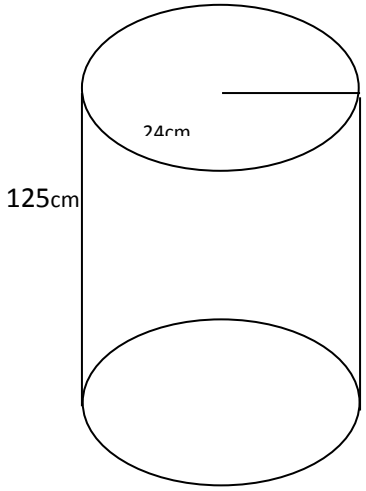


The diagram above show a rectangular trough of length 150cm and width 20cm.The trough was completely filled with 48000cm^3 $of\ water$ from the tank.

(a) Calculate the depth of the tank (2 marks)

(b) After the trough had been filled, water started to leak out of the tank. Calculate the rate at which the level of water in the tank was falling (3 marks).

QUESTION TWO

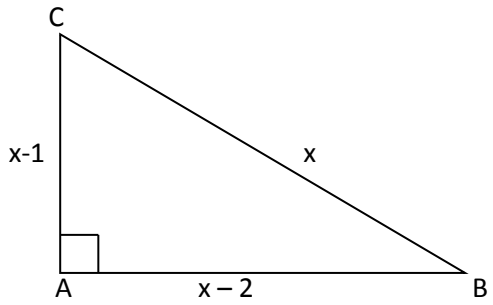


The diagram above shows a cylindrical water tank of radius 24cm and height 125cm.It is open on top and full of water. Taking $\pi\ to\ be\ 3.142$,calculate

(a) The volume in liters of water in the tank. (2 marks)

(b) The total surface area of the tank in metres per square. (3 marks)

QUESTION THREE



The diagram ABC is a right angled triangle in which AB=x-2 ,AC=x-1 and BC=x.

(a) Using the information given above, form an equation in x and show that it reduces to $x^2 - 6x + 5 = 0$ $(3\ marks)$

(b) Hence solve the equation. (2 marks)

QUESTION FOUR

The sets A and B are integers.

Set A = (5 < X < 10),

B = (- 2 ≤ y ≤ 5). Calculate the

i) lowest value of y + x 1 mark

ii). lowest value 0f x - y 1 mark

iii) maximum value of x - y 1 mark

iv) maximum value of x ÷ y 1 mark

b.A straight line passes through the points

M (2 , 4) and N (8 , 12). Calculate

i) Gradient of the line MN 2 marks

ii) midpoint of line MN 2 marks

iii) Equation of the line MN 2 marks