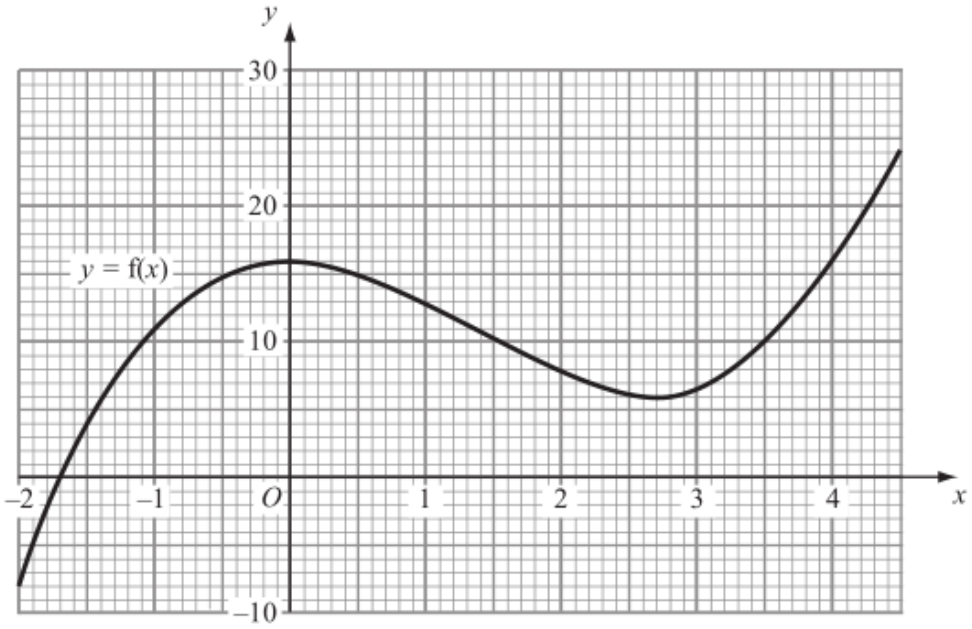
Hundred Starter 6th October

May 2008 3H

21. The diagram shows part of the graph of $y = f(x)$.



(a) Calculate an estimate for the gradient of the curve at the point where $x = 3$

(b) Find an estimate for the solution of the equation $f(x) = 0$

$x =$ .....

(1)

The equation $f(x) = mx + c$ where m and c are numbers, has three solutions.
Two of the solutions are $x = -1$ and $x = 1$

(c) (i) Find the value of c.

$c =$ .....

(ii) Find the third solution of the equation $f(x) = mx + c$.

22.

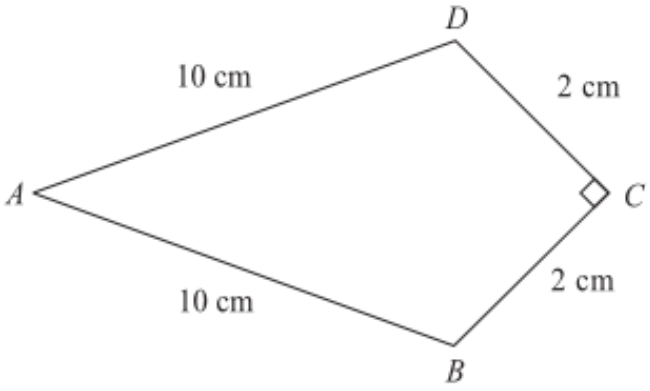


Diagram **NOT** accurately drawn

The diagram shows a kite $ABCD$.
$AB = AD = 10$ cm.
$CB = CD = 2$ cm.
Angle $BCD = 90°$.

Calculate the area of the kite.

May 2008 4H

19. A particle moves in a straight line through a fixed point O.
The displacement of the particle from O at time t seconds is s metres, where

$$s = t^2 - 6t + 10$$

(a) Find $\frac{ds}{dt}$

.....
(2)

(b) Find the velocity of the particle when $t = 5$

..... m/s
(2)

(c) Find the acceleration of the particle.

..... m/s^2
(2)

20. (a) Evaluate $5 \times 10^{12} + 9 \times 10^{12}$
Give your answer in standard form.

.....

(2)

(b) Each of the numbers p, q and r is greater than 1 and less than 10

$p \times 10^{15} + q \times 10^{15} = r \times 10^{n}$
$p + q > 10$

(i) Find the value of n.

$n =$ .....

(ii) Find an expression for r in terms of p and q.

$r =$ .....

(3)

22.

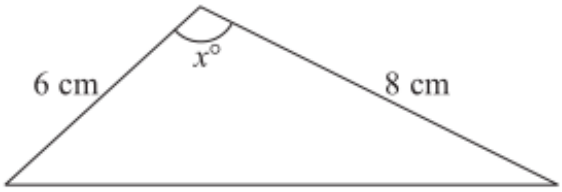


Diagram **NOT** accurately drawn

The area of the triangle is 12 cm^2.
The angle $x°$ is obtuse.
Calculate the value of x.