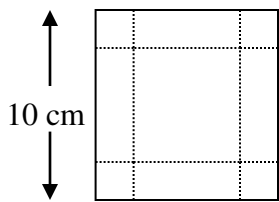


New Higher Homework 10

1. $y = x^3 + x^2 - 16x - 16.$

Find the coordinates of the stationary points and determine their nature.

2. For which values of x is the function $f(x) = \frac{1}{3}x^3 - 2x^2 - 5x$ decreasing?

3.  A box with no lid is made by taking a cardboard square of side 10 cm and cutting from its corners four small squares of side x cm.

(a) Show that the volume is given by $V = 4x^3 - 40x^2 + 100x.$

(b) Calculate the maximum possible volume of the box.

4. Find the exact value of each of these logs:

(a) $\log_3 27$ (b) $\log_5 \frac{1}{5}$

5. Simplify (a) $\log_6 9 + \log_6 4$ (b) $\log_3 54 - \log_3 6$ (c) $3\log_2 16$

6. Solve these equations: (a) $\log_2(x-4) = 3$ (b) $4^t = 33$

7. The sketch shows the graphs of $y = 4x - x^2$ and $y = x.$

Calculate the area enclosed by the parabola and the straight line.

