

6th June



Corbettmaths

How many odd numbers greater than 20000 can be formed from the digits

1 4 7 8 9

with no repetition of any digit?

$$\frac{4 \times 3 \times 2 \times 1 \times 1}{478} = 24$$

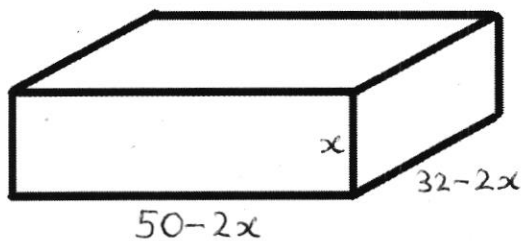
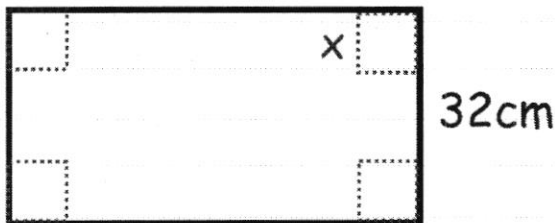
$$\frac{3 \times 2 \times 1 \times 2}{489} = 36 +$$

$$\frac{9}{478} = \underline{\underline{60}}$$

A rectangular sheet of card measures 50cm by 32cm.

Four squares of side length x cm are cut from each corner and the remaining card is folded to make a tray.

50cm



Show that the volume of the tray is

$$V = 1600x - 164x^2 + 4x^3$$

$$V = x(50 - 2x)(32 - 2x)$$

$$= x(1600 - 164x + 4x^2)$$

$$= \underline{\underline{1600x - 164x^2 + 4x^3}}$$

Find the value of x for which V is a maximum.

$$\frac{dV}{dx} = 1600 - 328x + 12x^2$$

$$\text{At max } 12x^2 - 328x + 1600 = 0$$

$$\Rightarrow x = \frac{328 \pm \sqrt{30784}}{24}$$

$$\Rightarrow x = \underline{\underline{20.98, 6.356 \text{ cm}}}$$

$$\downarrow$$

$$32 - 2x < 0$$

Find the maximum value of V

$$\underline{\underline{V = 4571 \text{ cm}^3}}$$