23rd September
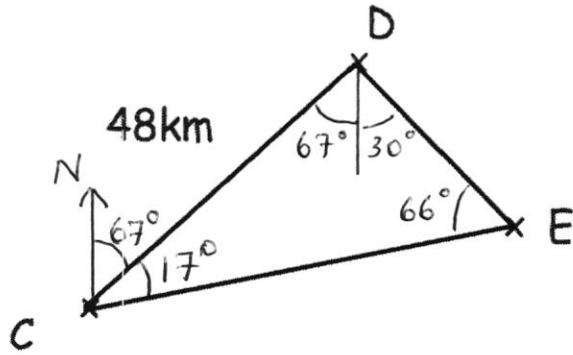
A curve has gradient function

$$\frac{dy}{dx} = 3x^2 - 7$$

Work out the values of x for which the rate of change of y with respect to x is 5

$3x^2 - 7 = 5$
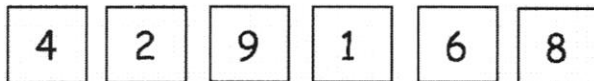$3x^2 = 12$
$x^2 = 4$
$\underline{x = \pm 2}$

Donhampton is 48km from Castletown on a bearing of 067°.

Eastville is on a bearing of 084° from Castletown and on a bearing of 150° from Donhampton.

Calculate the distance of Eastville from Castletown.

$$\frac{DE}{\sin 17°} = \frac{48}{\sin 66°}$$

$$DE = \frac{48 \sin 17°}{\sin 66°}$$

$$= 15.4 \text{ km}.$$

George has the six number cards below.

| 4 | 2 | 9 | 1 | 6 | 8 |

How many 4-digit **even** numbers can be made that are greater than 5000?

$\dfrac{3 \times 4 \times 3}{\underset{9}{6 \; 8}} \quad \underline{}_{2} = 36$

$\dfrac{3}{\underset{9}{6 \; 8}} \times 4 \times 3 \quad \underline{}_{4} = 36$

$\dfrac{2 \times 4 \times 3}{\underset{9}{8 \; 9}} \quad \underline{}_{6} = 24$

$\dfrac{2}{6 \; 9} \times 4 \times 3 \quad \underline{}_{8} = 24$

$\underline{120}$