

## 8.1) Pascal's triangle

## Worked example

Use Pascal's triangle to find the expansion of  
 $(x + 4y)^5$

## Your turn

Use Pascal's triangle to find the expansion of  
 $(x + 2y)^3$

$$x^3 + 6x^2y + 12xy^2 + 8y^3$$

## Worked example

Use Pascal's triangle to find the expansion of  $(5x - 2)^4$

## Your turn

Use Pascal's triangle to find the expansion of  $(2x - 5)^4$

$$16x^4 - 160x^3 + 600x^2 - 1000x + 625$$

## Worked example

Find the expansion of  $(3 + 2x)^4$

## Your turn

Find the expansion of  $(2 + 3x)^4$

$$16 + 96x + 216x^2 + 216x^3 + 81x^4$$

## Worked example

Find the expansion of  $(1 - 4x)^3$

## Your turn

Find the expansion of  $(1 - 2x)^3$

$$1 - 6x + 12x^2 - 8x^3$$

## Worked example

The coefficient of  $x^2$  in the expansion of  $(2 - cx)^3$  is 294.

Find the possible value(s) of the constant  $c$ .

## Your turn

The coefficient of  $x^2$  in the expansion of  $(2 - cx)^5$  is 720.

Find the possible value(s) of the constant  $c$ .

$$c = \pm 3$$

## Worked example

The coefficient of  $x^3$  in the expansion of  $(3 - cx)^5$  is 720.

Find the possible value(s) of the constant  $c$ .

## Your turn

The coefficient of  $x^3$  in the expansion of  $(2 - cx)^5$  is  $-1080$ .

Find the possible value(s) of the constant  $c$ .

$$c = 3$$

## Worked example

In the binomial expansion of  $(3 + kx)^7$ , where  $k$  is a constant, the coefficient of  $x^2$  is 2 times the coefficient of  $x$ .

Find the value of  $k$

## Your turn

In the binomial expansion of  $(2 + kx)^7$ , where  $k$  is a constant, the coefficient of  $x^2$  is 6 times the coefficient of  $x$ .

Find the value of  $k$

$$k = 4$$