

## Completing the Square



## REVISE THIS TOPIC

1 Write 
$$x^2 + 6x + 11$$
 in the form  $(x + a)^2 + b$ 

$$(x+3)^2-9+11$$

$$(\chi + 3)^2 + 2$$

(Total for Question 1 is 2 marks)

2 Write 
$$x^2 + 8x + 30$$
 in the form  $(x + a)^2 + b$ 

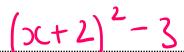
$$(x+4)^2 - 16 + 30$$

$$(20+4)^2+14$$

(Total for Question 2 is 2 marks)

**3** Write 
$$x^2 + 4x + 1$$
 in the form  $(x + a)^2 - b$ 

$$(x+2)^2-4+1$$



(Total for Question 3 is 2 marks)





**4** Write  $x^2 - 10x + 12$  in the form  $(x - a)^2 - b$ 

$$(x-5)^2-25+12$$

$$(x-5)^2-13$$

(Total for Question 4 is 2 marks)

**5** Write  $x^2 - 2x + 13$  in the form  $(x - a)^2 + b$ 

$$(x-1)^2-1+13$$

$$(x-1)^2 + 12$$

(Total for Question 5 is 2 marks)

**6** Write  $x^2 - 12x - 16$  in the form  $(x - a)^2 + b$ 

$$(x-6)^2-36-16$$

$$(x-6)^2-52$$

(Total for Question 6 is 2 marks)

7 Write  $x^2 - 20x$  in the form  $(x - a)^2 - b$ 

$$(x-10)^2-100$$



$$(\chi - 10)^2 - 100$$

(Total for Question 7 is 2 marks)

**8** Write  $x^2 + 3x + 5$  in the form  $(x + a)^2 + b$ 

$$(x+\frac{3}{2})^2-\frac{9}{4}+5$$
  
 $(x+\frac{3}{2})^2-\frac{9}{4}+\frac{39}{4}$ 

$$(x+\frac{3}{2})^2+\frac{11}{4}$$

(Total for Question 8 is 3 marks)

**9** Write  $x^2 - 5x + 7$  in the form  $(x - a)^2 + b$ 

$$(\chi - \frac{5}{2})^2 - \frac{25}{4} + 7$$
  
 $(\chi - \frac{5}{2})^2 - \frac{25}{4} + \frac{28}{4}$ 

$$(x-\frac{5}{2})^2+\frac{3}{4}$$

(Total for Question 9 is 3 marks)

**10** Write  $x^2 + 9x + 3$  in the form  $(x + a)^2 - b$ 

$$(\chi + \frac{9}{2})^2 - \frac{81}{4} + \frac{3}{4}$$
  
 $(\chi + \frac{9}{4})^2 - \frac{81}{4} + \frac{12}{4}$ 

$$(x+\frac{9}{2})^2-\frac{69}{4}$$

(Total for Question 10 is 3 marks)

**11** Write  $x^2 - x - 2.75$  in the form  $(x - a)^2 - b$ 

$$(x-\frac{1}{2})^2-\frac{1}{4}-2\frac{3}{4}$$



 $(x-1)^2-3$ 

(Total for Question 11 is 3 marks)

## 12 Here is an identity

$$x^2 + px + 32 \equiv (x+5)^2 - q$$

Work out the values of p and q.

$$x^2 + px + 32 = x^2 + 10x + 25 - 9$$

$$px = 10x$$

$$p = 10$$

$$32 = 25 - 9$$
  
 $9 = 25 - 32$   
 $9 = -7$ 

$$p = \frac{10}{q}$$

(Total for Question 12 is 3 marks)

## 13 Here is an identity

$$x^2 - 8x + p \equiv (x + q)^2 - 4$$

Work out the values of p and q.

$$x^{2} - 8x + P = x^{2} + 2qx + q^{2} - 4$$

$$-8x = 2qx$$

$$-8 = 2q$$

$$-8 = 2q$$

$$q = -4$$

$$P = (-4)^{2} - 4$$

$$q = -4$$

(Total for Question 12 is 3 marks)

