

Turning Points by Completing the Square *fluency*



Write the coordinates of the turning point

1 $y = (x + 3)^2 - 5$

2 $y = (x - 2)^2 + 7$

3 $y = (x + 1)^2$

4 $y = (x - 6)^2 - 1$

5 $y = (x + 4)^2 + 3$

6 $y = (x - 5)^2 - 12$



Find the coordinates of the turning point

7 $y = x^2 + 6x + 2$

8 $y = x^2 - 4x + 9$

9 $y = x^2 + 10x$

10 $y = x^2 - 8x + 20$

11 $y = x^2 + 2x - 7$

12 $y = x^2 - 12x + 30$



Find the coordinates of the turning point

13 $y = x^2 + 3x + 1$

14 $y = x^2 - 5x + 4$

15 $y = x^2 + x - 2$

16 $y = x^2 - 7x$

17 $y = x^2 + 9x + 20$

18 $y = x^2 - 3x - 1$



Find the coordinates of the turning point

19 $y = 2x^2 + 8x + 3$

20 $y = 3x^2 - 12x + 5$

21 $y = 2x^2 - 4x - 1$

22 $y = 4x^2 + 8x$

23 $y = 5x^2 - 20x + 7$

24 $y = 2x^2 + 6x + 1$



Find the turning point. Write max if it is a maximum, min if it is a minimum.

25 $y = -x^2 + 6x - 2$

26 $y = 5 + 4x - x^2$

27 $y = -(x - 3)^2 + 8$

28 $y = 2x^2 - 8x + 1$

29 $y = 10 - 2x - x^2$

30 $y = -2x^2 + 4x + 3$