



Function Root Behaviour (Polynomials) - Function to Behaviour

1 What behaviour would this function have at its x-intercepts?

$$f(x) = (x - 2)^4(x - 3)$$

A at $x = 1$: crosses the x-axis and flattens
at $x = 4$: touches the x-axis without crossing

B at $x = 1$: touches the x-axis without crossing and flattens
at $x = 3$: crosses the x-axis

C at $x = 2$: touches the x-axis without crossing and flattens
at $x = 3$: crosses the x-axis

D at $x = -3$: crosses the x-axis
at $x = -2$: touches the x-axis without crossing and flattens

E at $x = 2$: crosses the x-axis
at $x = 3$: touches the x-axis without crossing and flattens

2 What behaviour would this function have at its x-intercepts?

$$f(x) = (x + 3)^4(x + 1)$$

A at $x = -3$: touches the x-axis without crossing and flattens
at $x = -1$: crosses the x-axis

B at $x = -3$: crosses the x-axis
at $x = -1$: touches the x-axis without crossing and flattens

C at $x = 1$: crosses the x-axis
at $x = 4$: crosses the x-axis

D at $x = 1$: crosses the x-axis
at $x = 3$: touches the x-axis without crossing and flattens

E at $x = -3$: touches the x-axis without crossing and flattens
at $x = -1$: touches the x-axis without crossing

3 What behaviour would this function have at its x-intercepts?

$$f(x) = (x + 3)^2(x - 2)^2$$

A at $x = 2$: touches the x-axis without crossing
at $x = 3$: touches the x-axis without crossing

B at $x = -3$: touches the x-axis without crossing
at $x = 1$: touches the x-axis without crossing

C at $x = -2$: touches the x-axis without crossing
at $x = 3$: touches the x-axis without crossing

D at $x = -3$: touches the x-axis without crossing
at $x = 2$: touches the x-axis without crossing

E at $x = -3$: touches the x-axis without crossing
at $x = -2$: touches the x-axis without crossing

4 What behaviour would this function have at its x-intercepts?

$$f(x) = (x + 2)^3x$$

A at $x = -2$: crosses the x-axis and flattens
at $x = 1$: crosses the x-axis

B at $x = 1$: crosses the x-axis
at $x = 3$: crosses the x-axis

C at $x = -2$: crosses the x-axis and flattens
at $x = 0$: crosses the x-axis

D at $x = -2$: crosses the x-axis
at $x = 0$: crosses the x-axis and flattens

E at $x = 0$: crosses the x-axis
at $x = 2$: crosses the x-axis and flattens

5 What behaviour would this function have at its x-intercepts?

$$f(x) = (x - 1)^2(x - 2)^2$$

A at $x = -2$: touches the x-axis without crossing
at $x = -1$: touches the x-axis without crossing

B at $x = -2$: touches the x-axis without crossing
at $x = 1$: touches the x-axis without crossing

C at $x = 1$: touches the x-axis without crossing
at $x = 2$: crosses the x-axis and flattens

D at $x = -1$: touches the x-axis without crossing
at $x = 2$: touches the x-axis without crossing

E at $x = 1$: touches the x-axis without crossing
at $x = 2$: touches the x-axis without crossing

6 What behaviour would this function have at its x-intercepts?

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

A at $x = -2$: crosses the x-axis
at $x = -1$: crosses the x-axis and flattens

B at $x = -2$: crosses the x-axis and flattens
at $x = -1$: crosses the x-axis

C at $x = -2$: touches the x-axis without crossing
at $x = -1$: crosses the x-axis and flattens

D at $x = 1$: crosses the x-axis
at $x = 3$: crosses the x-axis

E at $x = 1$: crosses the x-axis and flattens
at $x = 2$: crosses the x-axis

7 What behaviour would this function have at its x-intercepts?

$$f(x) = (x + 1)^3(x - 3)^4$$

A at $x = 0$: crosses the x-axis and flattens
at $x = 3$: touches the x-axis without crossing and flattens

B at $x = -1$: touches the x-axis without crossing and flattens
at $x = 3$: crosses the x-axis and flattens

C at $x = -1$: crosses the x-axis and flattens
at $x = 3$: touches the x-axis without crossing and flattens

D at $x = -3$: touches the x-axis without crossing and flattens
at $x = 1$: crosses the x-axis and flattens

E at $x = 3$: crosses the x-axis
at $x = 4$: crosses the x-axis and flattens

8 What behaviour would this function have at its x-intercepts?

$$f(x) = (x + 2)^3(x + 1)^4$$

A at $x = -2$: touches the x-axis without crossing and flattens
at $x = -1$: crosses the x-axis and flattens

B at $x = 3$: crosses the x-axis
at $x = 4$: crosses the x-axis

C at $x = -2$: crosses the x-axis and flattens
at $x = -1$: touches the x-axis without crossing and flattens

D at $x = 1$: touches the x-axis without crossing and flattens
at $x = 2$: crosses the x-axis and flattens

E at $x = -2$: crosses the x-axis and flattens
at $x = -1$: crosses the x-axis and flattens