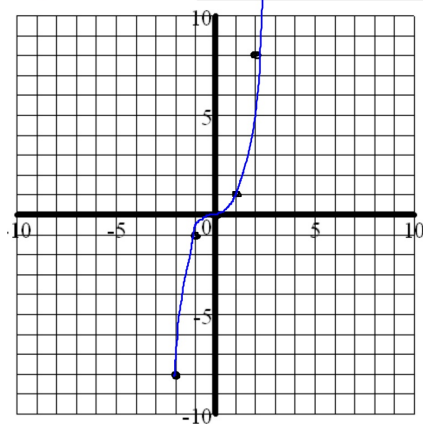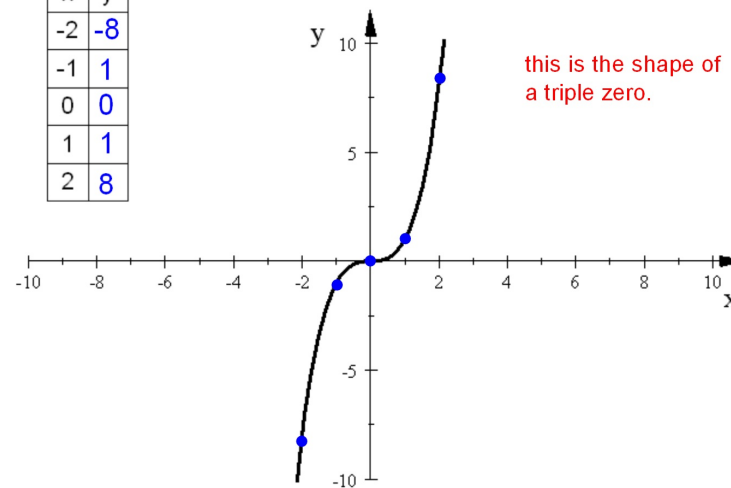$y = x^3$
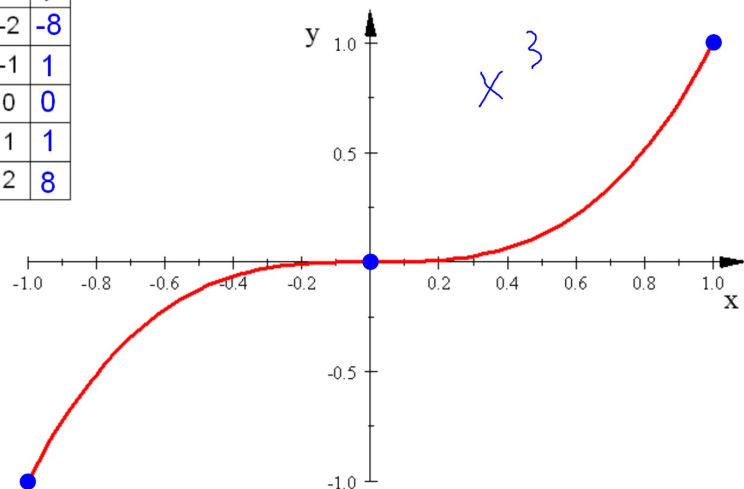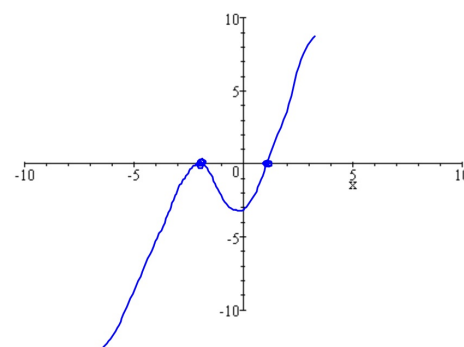

x	y
-2	-8
-1	-1
0	0
1	1
2	8

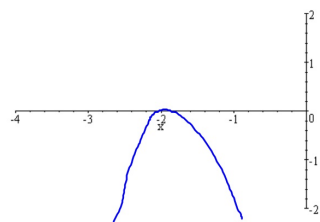| x	y
-2	-8
-1	1
0	0
1	1
2	8

this is the shape of a triple zero.

x	y
-2	-8
-1	1
0	0
1	1
2	8

x^3

1. Graph $y = (x - 1)(x + 2)^2$ in a Standard Window and sketch it below:

2. Investigate the graph around each zero

Around –2: Use the following window: $x : [-4,0]$ & $y : [-2,2]$
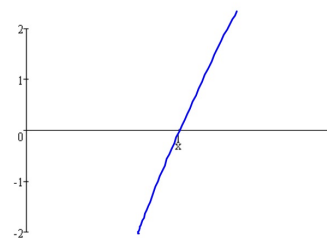
Sketch the graph below:

-2 is a double zero.

$(x+2)^2$

Double zeros look like Parabolas.

Describe what the graph looks like in this window.

Parabola

Around 1: Use the following window: $x : [0,2]$ & $y : [-2,2]$

Sketch the graph below:

$(x-1)^1$

1 is a single zero.
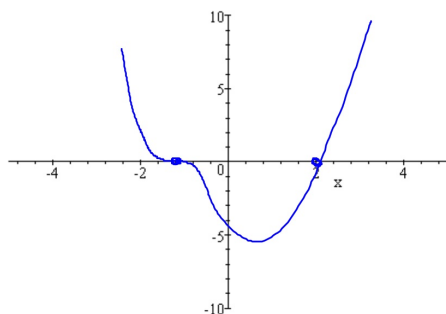
Single Zeros look like a line passing through the x-axis.

Describe what the graph looks like in this window.
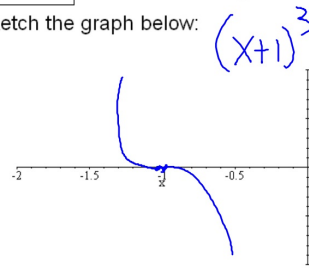
Line

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3. Graph $y = (x+1)^3(x-2)$ in the following window and sketch it below:

Window: $x : [-5,5]$ & $y : [-10,10]$

Around –1: Use the following window: $x : [-2,0]$ & $y : [-2,2]$
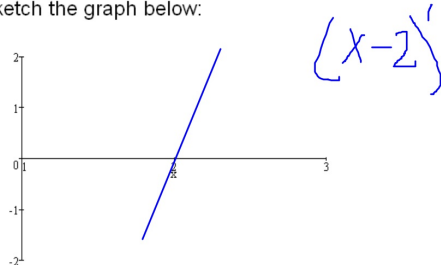
Sketch the graph below:

$(x+1)^3$

-1 is a triple zero

Describe what the graph looks like in this window.

Triple Zeros look like: they pass through the x-axis but flatten out as they pass through. Look like a cubic function

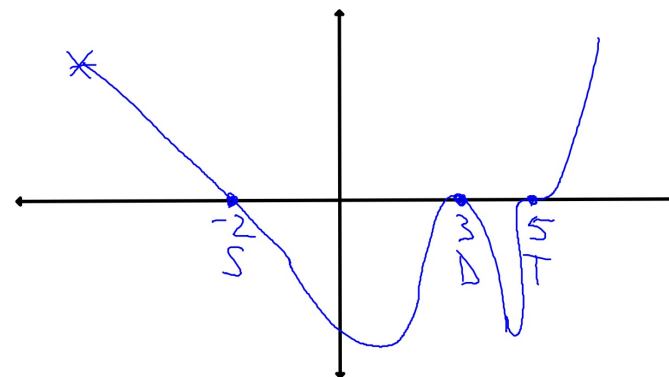Around 2: Use the following window: $x:[1,3]$ & $y:[-2,2]$

Sketch the graph below:

$(x-2)'$

Describe what the graph looks like in this window.

2 is a single zero.

Single Zeros look like a line passing through the x-axis.

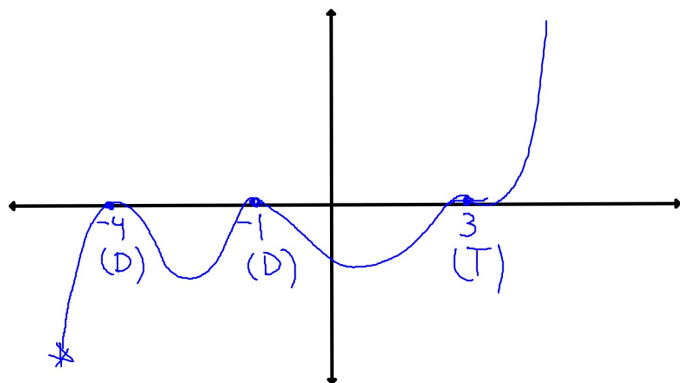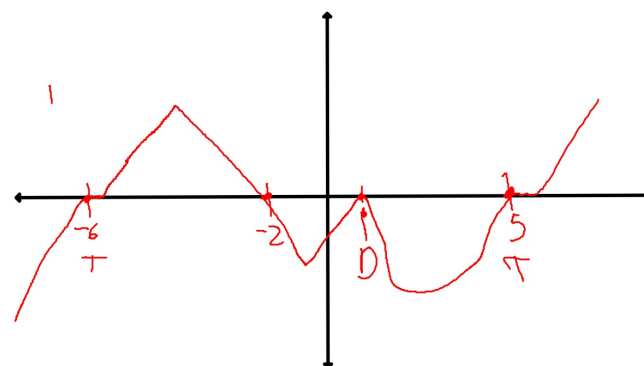$$y = (x+2)(x-3)^2(x-5)^3$$

Sketch this function using the shapes of the zeros. Start in the third quadrant.

$$y = (x+4)^2(x+1)^2(x-3)^3$$

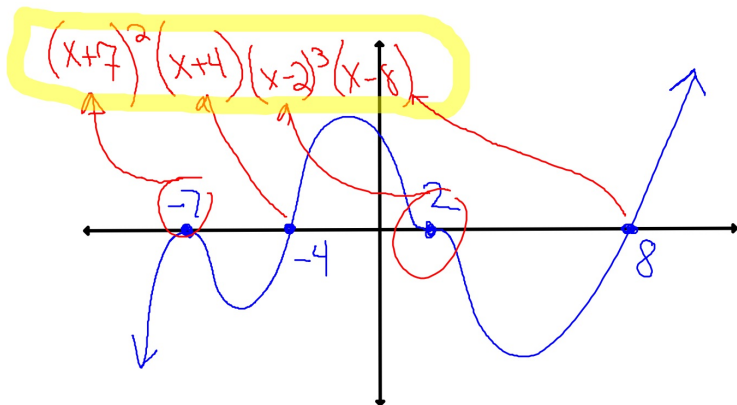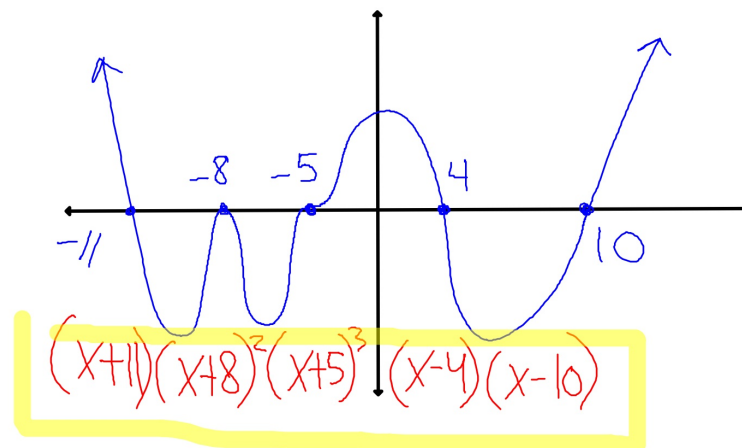Sketch this function using the shapes of the zeros. Start in the third quadrant.

$$y = (x - 5)^3(x + 6)^3(x + 2)(x - 1)^2$$

Write a possible equation for the function shown in this graph.

$(x+7)^2(x+4)(x-2)^3(x-8)$

Write a possible equation for the function shown in this graph.

$(x+11)(x+8)^2(x+5)^3(x-4)(x-10)$

Write a possible equation for the function shown in this graph.

$(x+5)(x+3)(x)(x-3)^3(x-6)^2(x-9)^3$