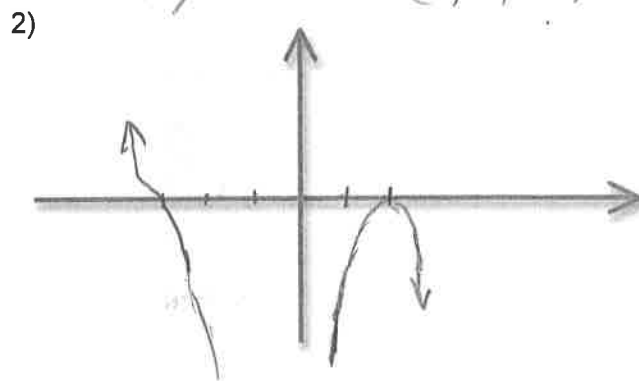
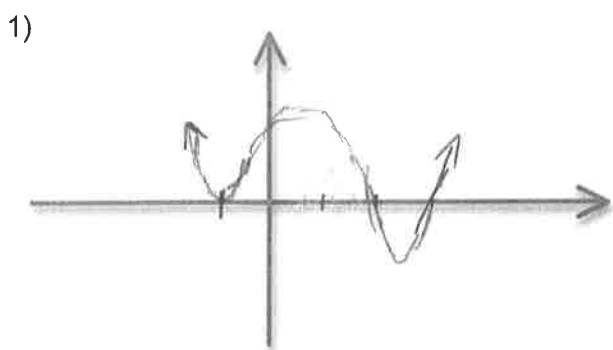


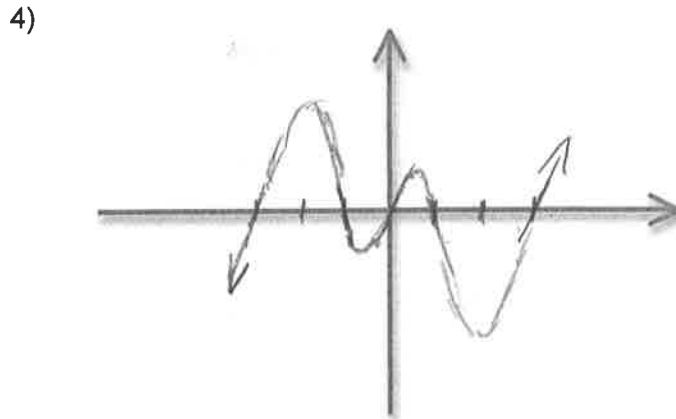
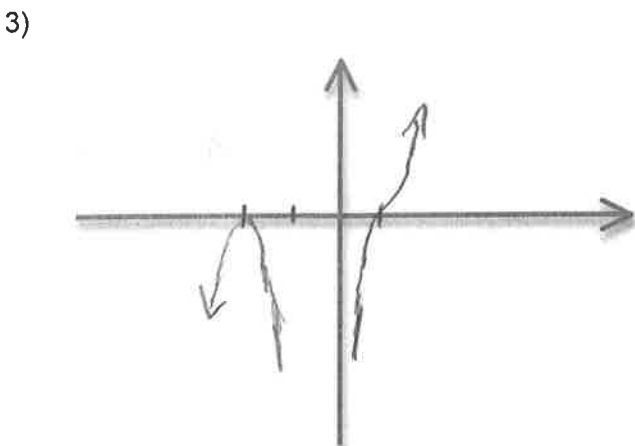
Graphing Polynomial Functions from Factored Form

Sketch the graph of each polynomial function.

Function	<i>n</i> degree	<i>a</i> Lead coef.	End Behavior (use <i>n</i> and <i>a</i>)	x-intercepts
$f(x) = (x+1)^2(x-2)(x-3)$	4	1	$x \rightarrow \infty, y \rightarrow \infty$ $x \rightarrow -\infty, y \rightarrow \infty$	$(-1, 0), (2, 0)$ $(3, 0), (4, 0)$
$f(x) = -2(x+3)^3(x-2)^2$	5	-2	$x \rightarrow \infty, y \rightarrow -\infty$ $x \rightarrow -\infty, y \rightarrow \infty$	$(-3, 0), (2, 0)$ $(-3, 0), (-3, 0), (2, 0)$



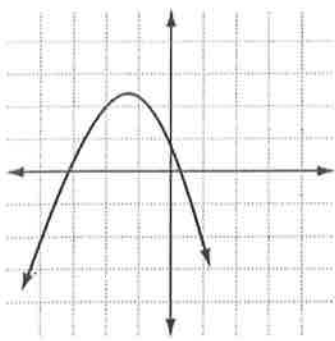
Function	<i>n</i> degree	<i>a</i> Lead coef.	End Behavior (use <i>n</i> and <i>a</i>)	x-intercepts
3. $f(x) = (x-1)^3(x+4)^2$	5	1	$x \rightarrow \infty, y \rightarrow \infty$ $x \rightarrow -\infty, y \rightarrow -\infty$	$(-4, 0), (1, 0)$ $(-4, 0)$ $(1, 0), (1, 0)$
4. $f(x) = x(x+3)(x+1)(x-1)(x-3)$	5	1	$x \rightarrow \infty, y \rightarrow \infty$ $x \rightarrow -\infty, y \rightarrow -\infty$	$(-3, 0), (-1, 0)$ $(0, 0), (1, 0)$ $(3, 0)$



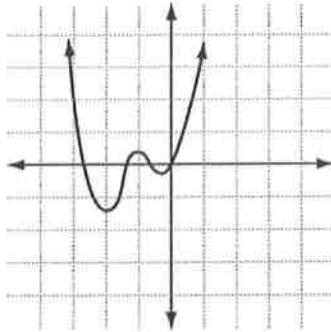
More Practice

Use the graphs to fill in the table

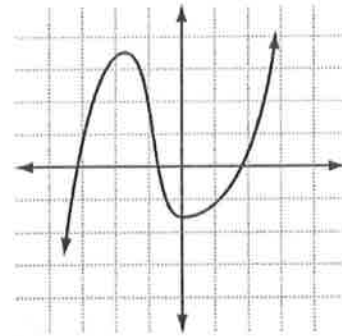
1.



2.



3.

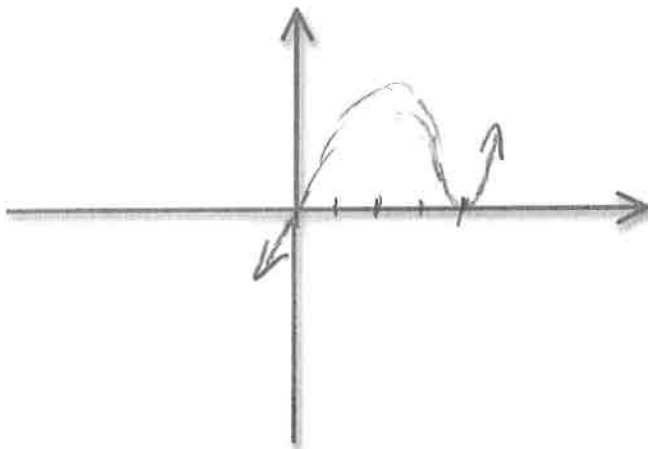


Function	n degree (circle one)	Lead coef. (circle one)	End Behavior	How many x-intercepts?
1.	Odd <u>Even</u>	Positive <u>negative</u>	$x \rightarrow \infty, y \rightarrow -\infty$ $x \rightarrow -\infty, y \rightarrow -\infty$	2
2.	Odd <u>Even</u>	<u>Positive</u> negative	$x \rightarrow \infty, y \rightarrow \infty$ $x \rightarrow -\infty, y \rightarrow \infty$	4
3.	<u>Odd</u> Even	<u>Positive</u> negative	$x \rightarrow \infty, y \rightarrow \infty$ $x \rightarrow -\infty, y \rightarrow -\infty$	3

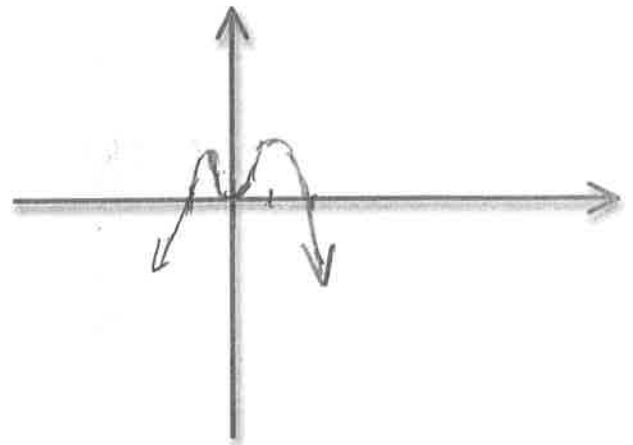
Fill in the table for each of the following functions, then sketch the graphs.

Function	n degree	a Lead coef.	End Behavior (use n and a)	x-intercepts
4. $f(x) = x(x-4)^2$	3	1	$x \rightarrow \infty, y \rightarrow \infty$ $x \rightarrow -\infty, y \rightarrow -\infty$	3
5. $f(x) = -x^2(x-2)(x+1)$	4	-1	$x \rightarrow \infty, y \rightarrow -\infty$ $x \rightarrow -\infty, y \rightarrow -\infty$	4

4)

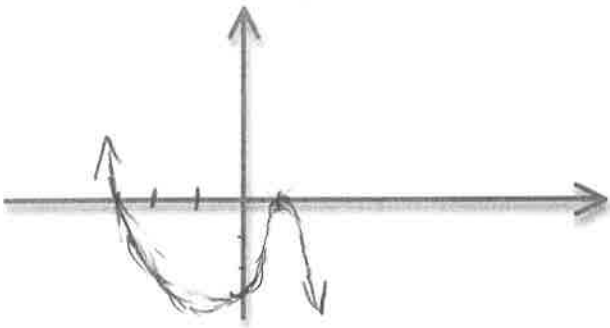


5)

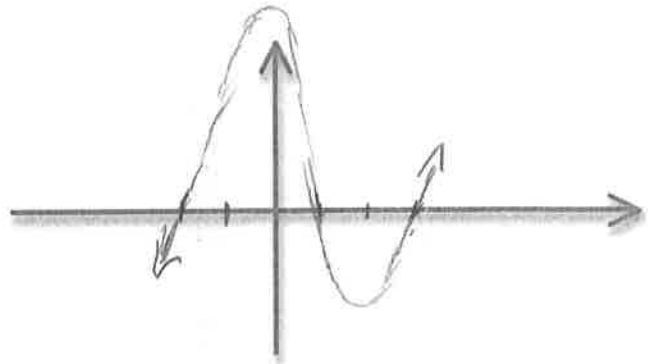


Function	n degree	a Lead coef.	End Behavior (use n and a)	x-intercepts
6. $f(x) = -(x-1)^2(x+3)$	3	-1	$x \rightarrow \infty, y \rightarrow -\infty$ $x \rightarrow -\infty, y \rightarrow \infty$	$(-3, 0), (1, 0)$ $(1, 0)$
7. $f(x) = (x+2)(x-3)(x-1)$	3	1	$x \rightarrow \infty, y \rightarrow \infty$ $x \rightarrow -\infty, y \rightarrow -\infty$	$(-2, 0), (1, 0),$ $(3, 0)$

$$6. f(x) = -(x-1)^2(x+3)$$



$$7. f(x) = (x+2)(x-3)(x-1)$$



Now state the intervals where the function is above (positive) or below (negative) the x-axis. Use inequality notation.

above x-axis (function is positive)

$$\underline{x < -3}$$

below x-axis (function is negative)

$$\underline{-3 < x < 1}$$

$$\text{and } x > 1$$

above x-axis (function is positive)

$$\underline{-2 < x < 1 \text{ and } x > 3}$$

below x-axis (function is negative)

$$\underline{x < -2 \text{ and } 1 < x < 3}$$