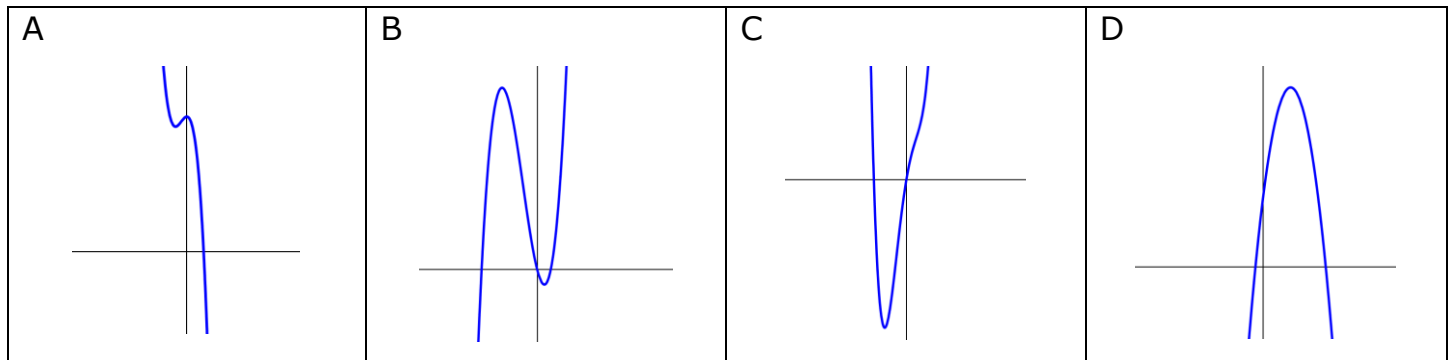


A2 Homework: Sketching Polynomial Functions

State the degree, y-intercept and end behavior. Then match each polynomial to its graph.



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

2. $f(x) = -2x^2 + 8x + 5$

3. $f(x) = x^4 - 3x^2 + 6x$

4. $f(x) = -x^3 - 4x^2 + 8$

For each polynomial:

a) Find the real zeros. Determine whether the graph will cross or bounce at each zero.

b) Find the y-intercept.

c) State the degree and the max number of turning points.

d) State the end behavior.

e) Sketch the graph of the polynomial function. Plot extra points when necessary.

5. $f(x) = x^4 - 4x^2$

6. $f(x) = x^3 - 4x$

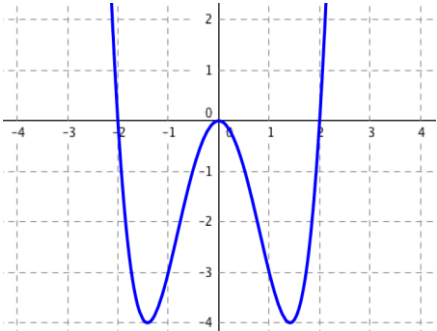
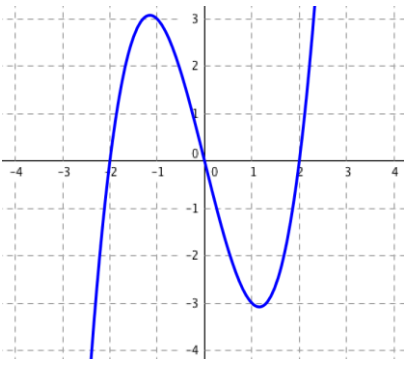
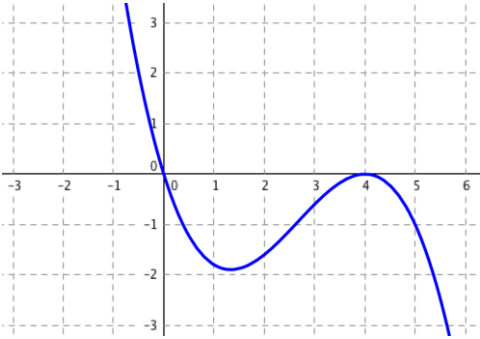
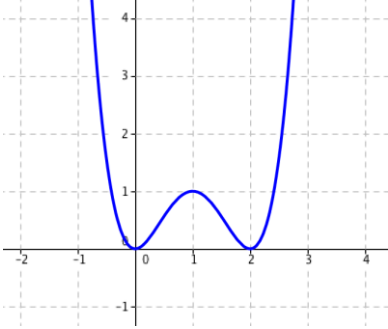
7. $y = -\frac{1}{5}x(x-4)^2$

8. $f(x) = x^4 - 4x^3 + 4x^2$

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

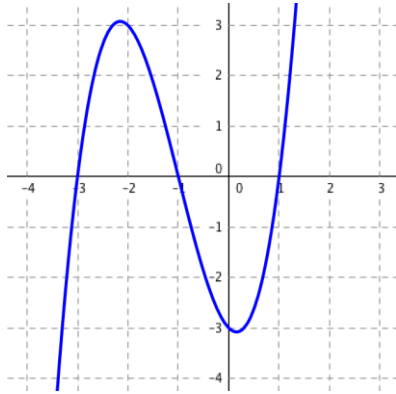
10. $g(x) = 6x^2 - 3x^3$

ANSWERS

<p>1. Degree: 3, $f(0) = 0$, $x \rightarrow -\infty, f(x) \rightarrow -\infty$, $x \rightarrow \infty, f(x) \rightarrow \infty$, B</p>	<p>2. Degree: 2, $f(0) = 5$, $x \rightarrow -\infty, f(x) \rightarrow -\infty$, $x \rightarrow \infty, f(x) \rightarrow -\infty$, D</p>
<p>3. Degree: 4, $f(0) = 0$, $x \rightarrow -\infty, f(x) \rightarrow \infty$, $x \rightarrow \infty, f(x) \rightarrow \infty$, C</p>	<p>4. Degree: 3, $f(0) = 8$, $x \rightarrow -\infty, f(x) \rightarrow \infty$, $x \rightarrow \infty, f(x) \rightarrow -\infty$, A</p>
<p>5.</p> <p>a. $x = -2$ (cross), 0 mult 2 (bounce), 2 (cross)</p> <p>b. $f(0) = 0$</p> <p>c. Degree = 4, At most 3 turns</p> <p>d. $x \rightarrow -\infty, f(x) \rightarrow \infty$</p> <p>e. $x \rightarrow \infty, f(x) \rightarrow \infty$</p> 	<p>6.</p> <p>a. $x = -2$ (cross), 0 (cross), 2 (cross)</p> <p>b. $f(0) = 0$</p> <p>c. Degree: 3, At most 2 turns</p> <p>d. $x \rightarrow -\infty, f(x) \rightarrow -\infty$</p> <p>e. $x \rightarrow \infty, f(x) \rightarrow \infty$</p> 
<p>7.</p> <p>a. $x = 0$ (cross), 4 mult 2 (bounce)</p> <p>b. $f(0) = 0$</p> <p>c. Degree: 3, At most 2 turns</p> <p>d. $x \rightarrow -\infty, f(x) \rightarrow \infty$</p> <p>e. $x \rightarrow \infty, f(x) \rightarrow -\infty$</p> 	<p>8.</p> <p>a. $x = 0$ mult 2 (bounce), 2 mult 2 (bounce)</p> <p>b. $f(0) = 0$</p> <p>c. Degree: 4, At most 3 turning points</p> <p>d. $x \rightarrow -\infty, f(x) \rightarrow \infty$</p> <p>e. $x \rightarrow \infty, f(x) \rightarrow \infty$</p> 

9.

- a. $x = -3$ (cross), -1 (cross), 1 (cross)
- b. $f(0) = -3$
- c. Degree: 3, At most 2 turning points
- d. $x \rightarrow -\infty, f(x) \rightarrow -\infty$
- e. $x \rightarrow \infty, f(x) \rightarrow \infty$



10.

- a. $x = 0$ mult 2 (bounce), 2 (cross)
- b. $f(0) = 0$
- c. Degree: 3, At most 2 turning points
- d. $x \rightarrow -\infty, f(x) \rightarrow \infty$
- e. $x \rightarrow \infty, f(x) \rightarrow -\infty$

