

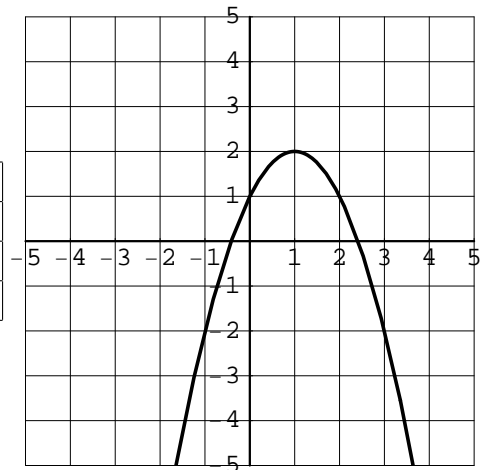
NAME: _____

Math 103L: Quadratics and general polynomials (Section 2.3)

These problems are a sample of the kinds of problems that may appear on the final exam. Some answers are included to indicate what is expected. Problems that require a summary statement are marked with **Sum**. The summary statements should be written in complete sentences and they should include the units of measurement for all quantities mentioned in the summary.

1. The graph of a quadratic function $f(x)$ is shown below.

Find the vertex of the parabola:	
Find $f(2)$	
Write an equation for $f(x)$	
$f(x) =$	



2. Let $f(x)$ be the quadratic function:

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

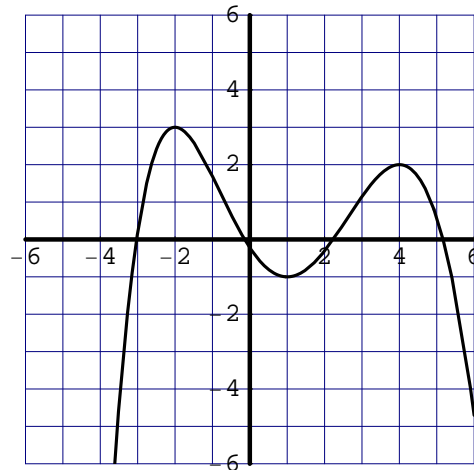
- (a) By completing the square, write $f(x)$ in the vertex-form.
- (b) What is the vertex of the parabola?
- (c) What is the maximum or minimum value of the function?
- (d) What is the range of the function?
- (e) What is the y -intercept?
- (f) Does the parabola have one, two, or no x -intercepts?

3. Consider the polynomial function

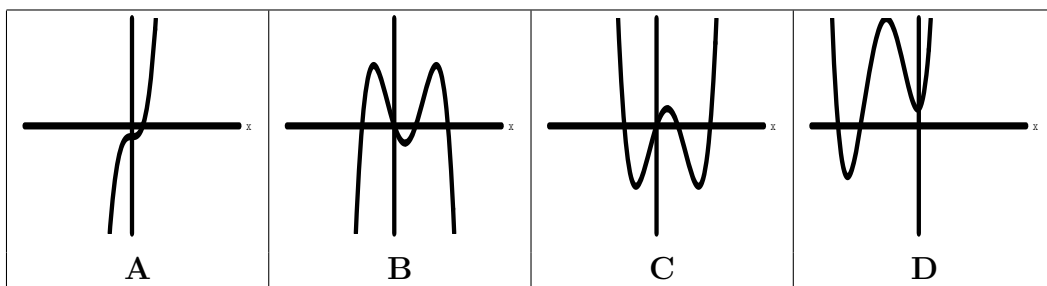
$$f(x) = 2x^4 - 3x^2 + 4x - 7.$$

- (a) What is the degree of this polynomial?
 - (b) What is the maximum number of times this polynomial can intersect the x -axis?
 - (c) What is the maximum number of turning points this polynomial can have?
4. Find the coordinates of the turning points in the graph below. Identify each turning point as either a local maximum or a local minimum.

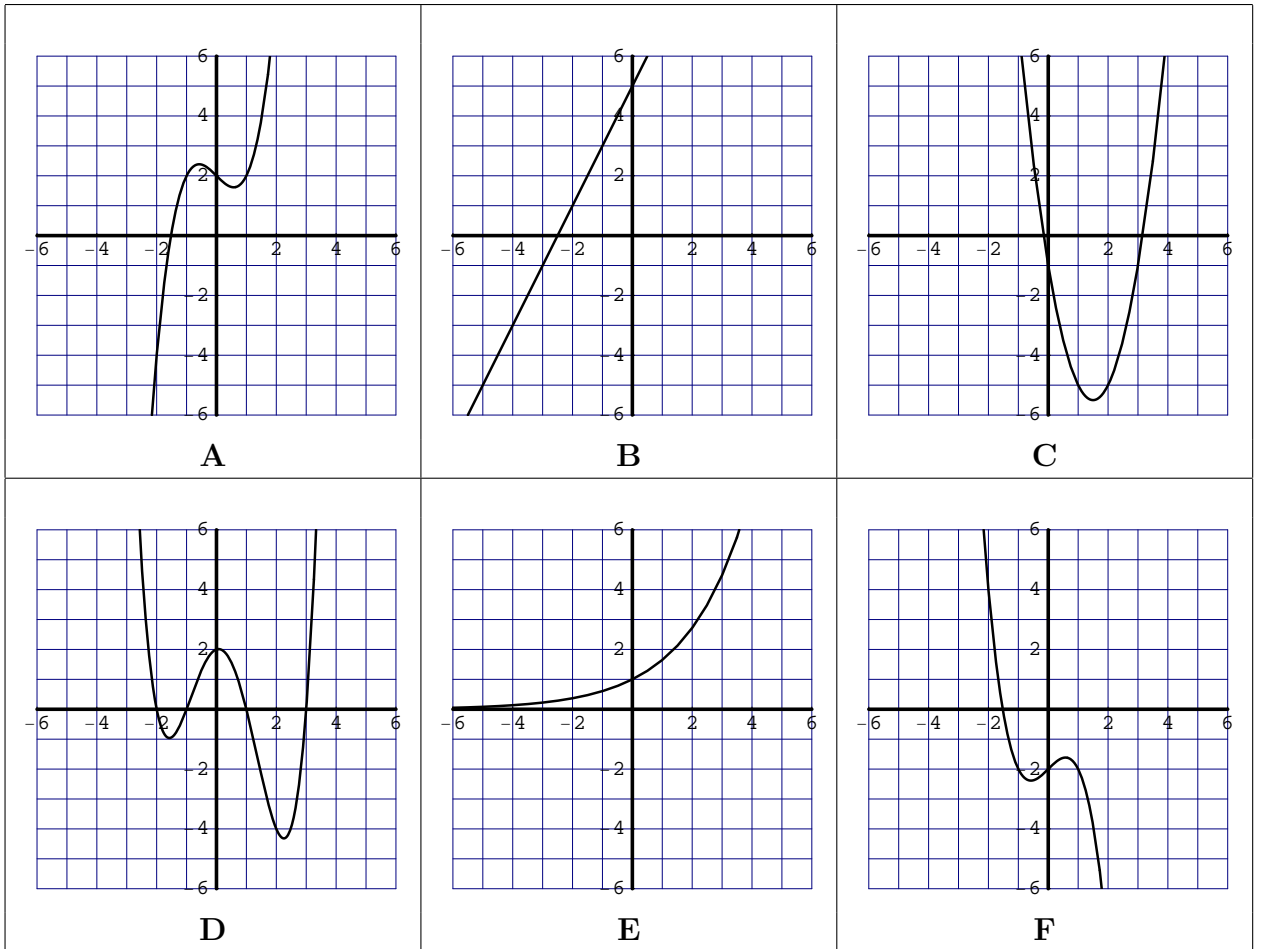
Turning point coordinates	Local max or min?



5. Let $f(x) = ax^4 + bx^3 + cx^2 + dx + e$ be a polynomial function of degree 4, where a is positive and the function has four x -intercepts. Which one of the graphs below could be the graph of $y = f(x)$? Why?



6. Match the graph with function:



Graph	Function
	$f(x) = 2x^2 - 6x - 1$
	$f(x) = -x^3 + x - 2$
	$f(x) = (1/3)(x - 1)(x + 2)(x - 3)(x + 1)$
	$f(x) = x^3 - x + 2$

7. Relative to the graph of

$$y = \frac{1}{x+1},$$

the graphs of the following equations have been changed in what way?

Answer

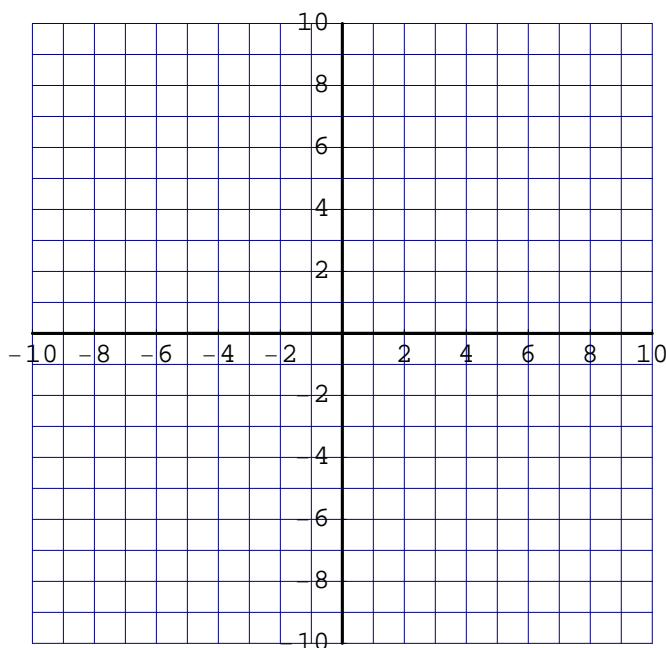
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	1. $y = \frac{5}{x+1}$
	2. $y = \frac{1}{(x+5)+1}$
	3. $y = \frac{1}{x+1} - 5$

A	shifted 5 units right
B	shifted 5 units left
C	stretched vertically by a factor of 5
D	shrunk vertically by a factor of 1/5
E	shifted 5 units up
F	shifted 5 units down

8. Consider $y = \frac{-6x+3}{2x-4}$.

(a) On the axes below graph $y = \frac{-6x+3}{2x-4}$. Be sure to label the x and y intercepts.



(b) Details

Answer

What is $g(3) = ?$	
What is the domain of $g(x) = \frac{-6x+3}{2x-4}$?	
What is the range of $g(x) = \frac{-6x+3}{2x-4}$?	
What is $\lim_{x \rightarrow \infty} \frac{-6x+3}{2x-4}$?	

9. If you have time repeat above with $y = \frac{3x-5}{3x-6}$