

No quiz today, 3.1 HW is due today, but take a minute right now to get your ordering figured out for 6 & 7 on pg.8

Questions on 3.2 HW??

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3. $f(x) \cdot g(x)$

$f(x) = x + 2$

$g(x) = 2x - 4$

Vertex: $(0, -8)$

$x = 0$
axis of symmetry

$f(x) \cdot g(x) = (x+2)(2x-4)$

$2x^2 - 4x + 4x - 8$

$2x^2 - 8$

$2x^2 + 0x - 8$

$a = 2$
 $b = 0$
 $c = -8$

$2(x^2 - 4)$

$2(x+2)(x-2)$

$x = 2, -2$

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Polynomial Functions 9
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Name _____ Polynomial Functions 3.2

10

6. Determine where you would insert add the following expressions in question 3 (go insert these expressions where they belong in your list):

$$\left(\frac{1}{2}\right)^x \quad x^7 \quad -x^5 \quad x^6 \quad x^5$$

7. Now insert these same expressions to your list in question 4.

8. Write your process for ordering one variable polynomial expressions for both extremes (when x approaches infinity as well as when x approaches negative infinity).

monomial: one term $\rightarrow 3, x, 2x^3$

binomial: two terms $\rightarrow x+2, 3x^2-7$

trinomial: 3 terms $\rightarrow x^2+2x+1,$
 $3x^2+6x+9$

7°

polynomial: many terms

\rightarrow degree: highest power/exponent
of a polynomial

$$2x^1 - 4$$

polynomial
degree 1

$$4x^0 = 4 \cdot 1 = 4$$

$$4x^5 - 3x^2 - x$$

polynomial
degree 5

$$(x+4)(x-7)(x+5)$$

3.3 All About Behavior

A Practice Understanding Task



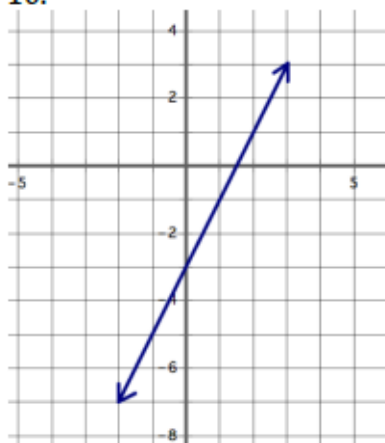
Part I: For each situation:

- Determine the function type. If it is a polynomial, also state the degree of the polynomial and whether it is an even degree polynomial or an odd degree polynomial.
- For each, state the end behavior based on your knowledge of the function
Use the format: *As $x \rightarrow -\infty$, $f(x) \rightarrow$ _____ and as $x \rightarrow \infty$ $f(x) \rightarrow$ _____*

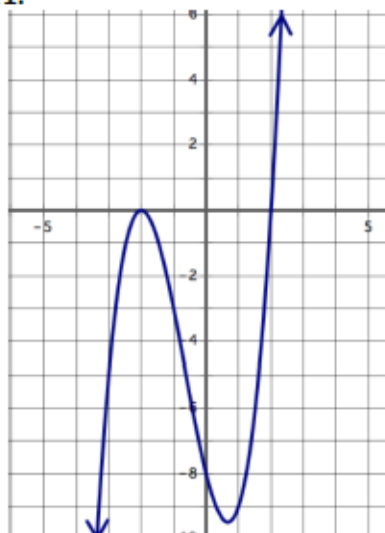
1. $f(x) = 3 + 2x$
2. $f(x) = x^4 - 16$
3. $f(x) = 3^x$
4. $f(x) = x^3 + 2x^2 - x + 5$
5. $f(x) = -2x^3 + 2x^2 - x + 5$
6. $f(x) = \log_2 x$
7. $f(x) = -2(x - 3)(x + 4)$
8. $f(x) = \sqrt{x} - 3$
9. $f(x) = 3(x - 1)(x + 2)(x - 4)$

Use the graphs below to describe the end behavior of each function. Use the same format as above.

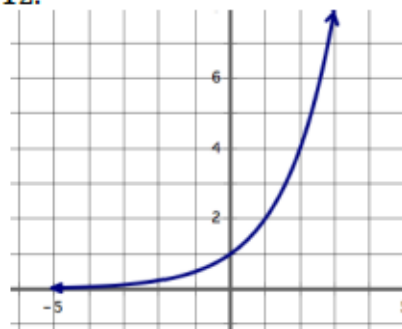
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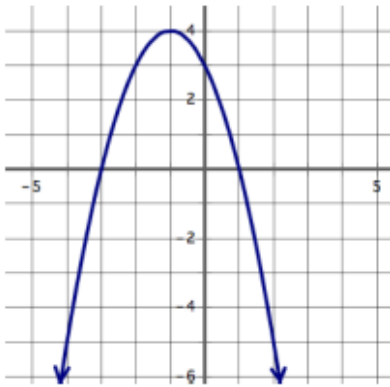
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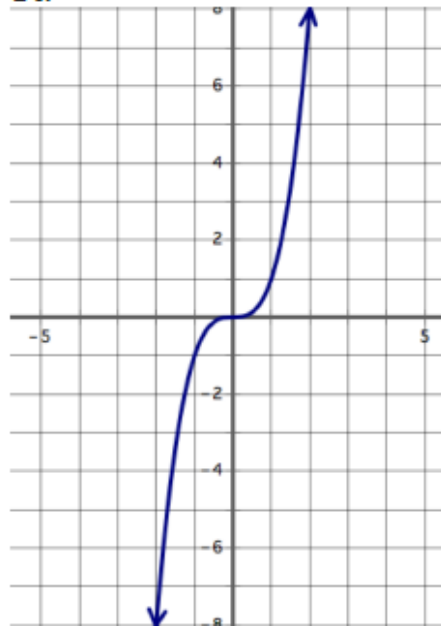
12.



13.



14.



15.



Part II: Use the functions from problems 1-18 to answer the following without finding the solution to each problem. Write a short explanation for each answer.

19. Compare problems 4 and 5: Which has the greatest value as $x \rightarrow \infty$?
20. Compare problems 6 and 12: Which has the greatest value as $x \rightarrow \infty$?
21. Compare problems 8 and 10: Which has the greatest value at as $x \rightarrow \infty$?
22. Compare problems 2 and 4: Which of these two polynomials has the highest degree?
23. Compare problems 7 and 13: Which has the highest maximum value?
24. Compare problems 8 and 11: Which has the greatest average rate of change from $[15, 20]$?
25. Compare problems 12 and 14: Which grows faster as $x \rightarrow \infty$?
26. Extension: Create three comparison problems of your own (be sure you know the answer).

Homework

3.3 "Ready, Set, Go"