

Alg2 CC Chapter 3 Review for Test

Name: key
Date: _____ HR: _____

Follow the directions to solve the following polynomial.

1. Multiply $(b + 1)(b^2 + 2b + 3)$.

$$\begin{array}{r} b^3 + 2b^2 + 3b \\ b^2 + 2b + 3 \\ \hline b^3 + 3b^2 + 5b + 3 \end{array}$$

2. Add. $(8a^2c + 7ac) + (a^2c + 6ac + 3) + (-8ac - 3)$

$$7a^2c + 5ac$$

3. What is the transformation of the graph of $f(x) = x^3$ that yields $f(x) = -3(x + 4)^3 + 5$?

Reflection
V. stretch BAF03
H. shift ← 4
V. shift ↑ 5

4. Find the perimeter of a triangle having sides $5x$, $2x + 3$, and $4x - 1$

Add all sides ↓ $11x + 2$

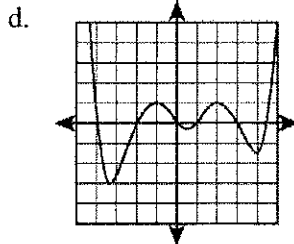
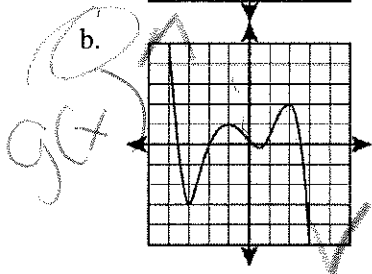
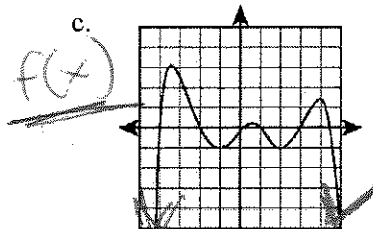
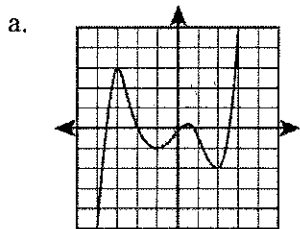
5. A rectangle has a base of $5a^2c$ and a height of $3a^3 - 2ac + 1$. Write and simplify an expression for the area of the rectangle. Show your work.

$$\begin{aligned} &5a^2c(3a^3 - 2ac + 1) \\ &15a^5c - 10a^3c^2 + 5a^2c \end{aligned}$$

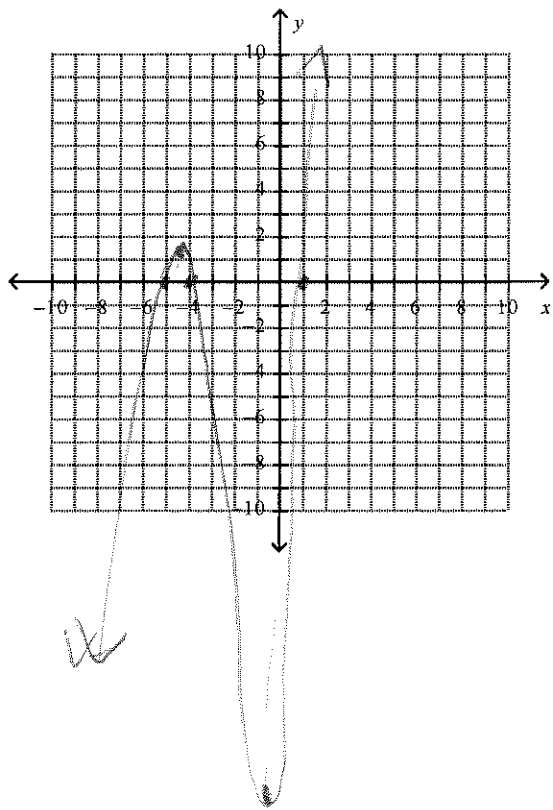
6. Identify the type of polynomial function $f(x) = 5x^2 - x + 1$

Quadratic

7. If $f(x)$ is an even function with a negative leading coefficient, $g(x)$ is an odd function with a negative leading coefficient, label the two graphs that represent $f(x)$ and $g(x)$.



8. Graph $f(x) = x^3 + 8x^2 + 11x - 20$. Identify the zeros if there are any and give the domain and range. State the end behavior of the graph. Give the max and mins.



Zeros: $(1, 0)$
 $(-5, 0)$
 $(-4, 0)$

Max $(-4.52, 1.38)$

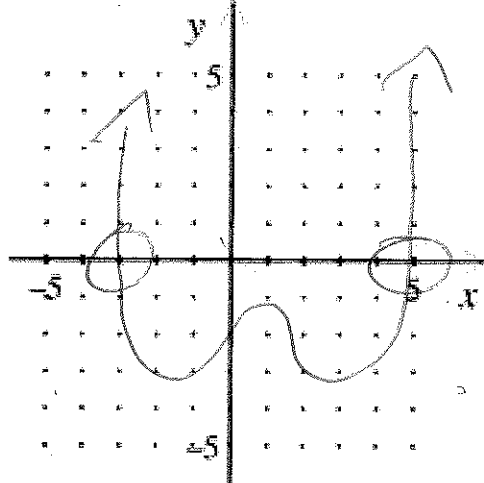
Min $(-0.811, -24.2)$

$x \rightarrow -\infty \quad f(x) \rightarrow -\infty$
 $x \rightarrow +\infty \quad f(x) \rightarrow +\infty$

D: $x \in \mathbb{R}$

R: $y \in \mathbb{R}$

9. Draw a graph of an even function with exactly two real zeros and a positive leading coefficient.



10. Subtract. $(4x^2 - 7x) - (2x^2 + 6x)$

$$2x^2 - 13x$$

11. Multiply $(2x + 3)(-4x - 2)$

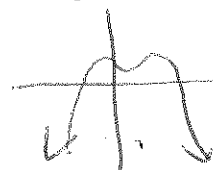
$$-8x^2 - 12x - 4x - 6$$

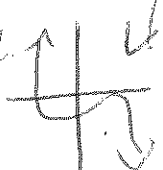
$$-8x^2 - 16x - 6$$

12. Multiply $(3x + 2)^2$

$$9x^2 + 12x + 4$$

13. Explain the difference of what an even degree graph with a negative leading coefficient looks like compared to an odd degree graph with a negative leading coefficient. Make a sketch of each graph before writing the explanation.

Even with a neg. L.C.  Even will have both ends going down because the leading coefficient is negative.

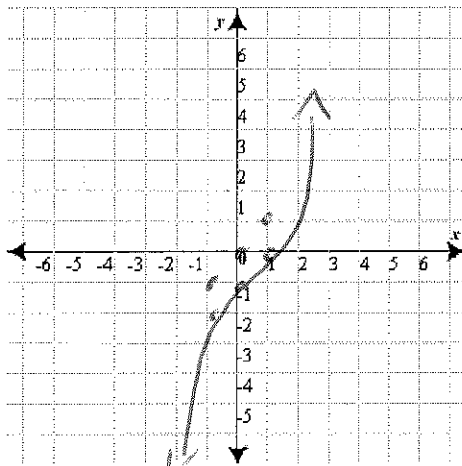
Odd w/a Neg L.C.  Odd will have the left end going up & the right end going down because the L.C. is negative.

3

$(2x+3y)^2$
 $x^2 + 4xy + 4y^2$

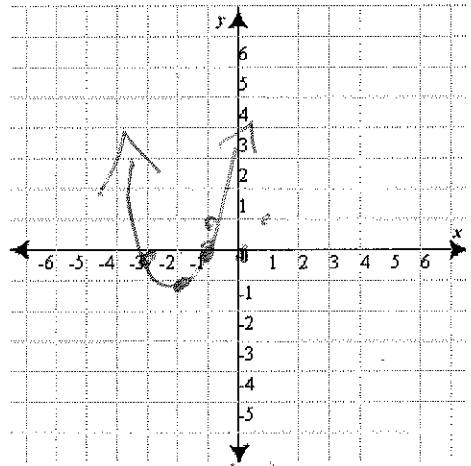
14. Graph each function and describe the transformations.

a. $f(x) = x^3 - 1$



V. Shift ↓ 1

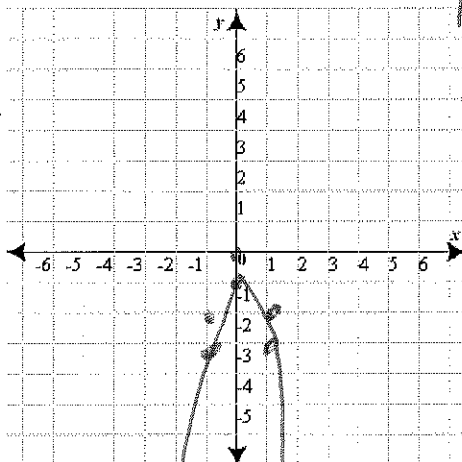
b. $h(x) = (x + 2)^4 - 1$



V. Shift ↓ 1
 H. Shift ← 2

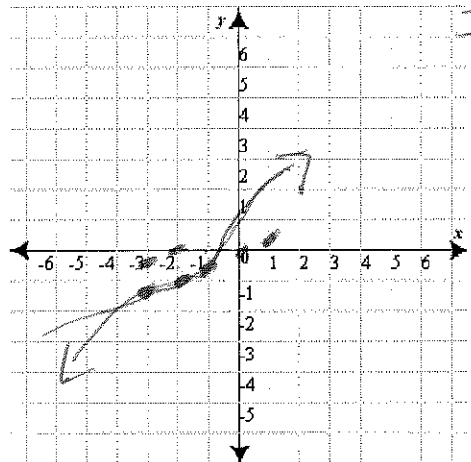
15. Graph each function and describe the transformations.

a. $f(x) = -2x^2 - 1$



Reflection
 V. stretch BAFO
 V. Shift ↓ 1

b. $h(x) = 1/3 (x + 2)^3 - 1$



V. Shrink BAFO 1/3
 H. Shift ← 2
 V. Shift ↓ 1

16. Identify the degree and the leading coefficient of $f(x) = 5x^2 - 4x^3 + 12 - 3x$.

D: 3
 LC: -4

17. Which function is not a polynomial function? EXPLAIN why!!

- a. $f(x) = 3x^4 - 5x + 7$
- b. $f(x) = x^3 + 2x^2 - 6x + 1$
- c. $f(x) = 2x^2 - 9x + 7/x + 8$
- d. $f(x) = x^2 + 4x + 3$

$\frac{7}{x} = 7x^{-1}$ All exponents have to be whole numbers to be a polynomial. x^{-1} is NOT a whole number exponent

17

Algebra 2 Review of Unit 3.1 - 3.6

- 1) Graphs of polynomials functions
- 2) Operations with polynomial functions
* add, subtract, and multiply

Describe the transformations in each function and state the vertex or turning point.

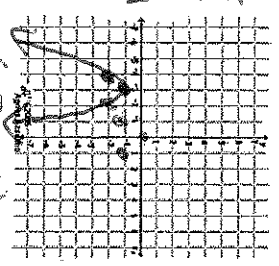
- 1) $f(x) = (x+3)^3 - 2$ H. Shift $\leftarrow 3$ V. Shift $\downarrow 2$
T.P.: $(-3, -2)$
- 2) $f(x) = 3/2(x-1)^4 + 3$ V. stretch $\times 3/2$ H. Shift $\rightarrow 1$
V. Shift $\uparrow 3$ V.T. $(1, 3)$
- 3) $f(x) = -2(x+1)^6 - 5$ Reflection, V. stretch $\times 2$ H. Shift $\leftarrow 1$
V. Shift $\downarrow 5$ V.T. $(-1, -5)$
- 4) $f(x) = 1/3x^5 - 6$ V. Shrink $\times 1/3$ V. Shift $\downarrow 6$
T.P.: $(0, -6)$

NO Calculator

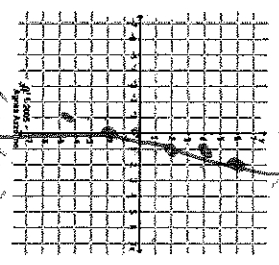
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Key

Graphing $f(x) = a(x-h)^n + k$
(NO CALCULATOR)



1) $f(x) = -(x+3)^4 - 1$
V/T.P: $(-3, -1)$
Domain: $x \in \mathbb{R}$
Range: $y \leq -1$

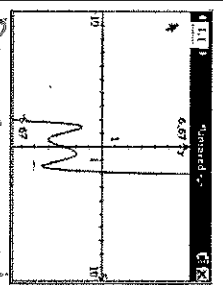


2) $f(x) = 4(x-1)^3 + 2$
V/T.P: $(1, 2)$
Domain: $x \in \mathbb{R}$
Range: $y \in \mathbb{R}$

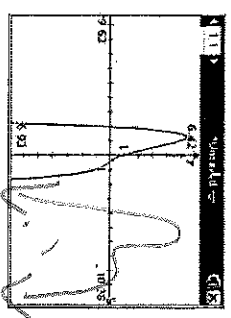
$-1 \overline{) 11 - 11}$
 $0 \overline{) 0 0 - 0}$
 $1 \overline{) 1 1 - 11}$

odd $\rightarrow 1 \uparrow 2$
 $-1 \overline{) 11 - 11}$
 $0 \overline{) 0 0 - 0}$
 $1 \overline{) 1 1 - 11}$

Describe the degree and leading coefficient of the polynomial function whose graph is shown.
END Behavior



D: 3, 5, 7 ... odd
L.C. positive
 $x \rightarrow +\infty f(x) \rightarrow +\infty$
 $x \rightarrow -\infty f(x) \rightarrow -\infty$



D: 2, 4, 6, even
L.C. Negative
 $x \rightarrow +\infty f(x) \rightarrow -\infty$
 $x \rightarrow -\infty f(x) \rightarrow +\infty$

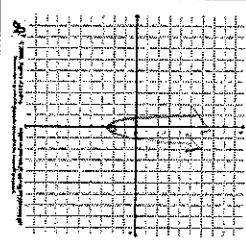
NO Calculator

GUIDED PRACTICE

Graph the polynomial function. State the zeros, max/min and end behavior.

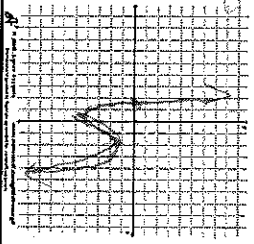
6. $f(x) = x^4 + 5x^2 - 2$

Min (0, -2)
 Zeros (-2, 0), (2, 0)
 $x \rightarrow +\infty, f(x) \rightarrow +\infty$ Max (1, 5), (-1, 3)
 $x \rightarrow -\infty, f(x) \rightarrow +\infty$



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

Zero (-1, 3), (0, -4), (4, 11)
 Min (-0.219, -4.11)
 Max (1.59, -1.37)



$x \rightarrow +\infty, f(x) \rightarrow -\infty$
 $x \rightarrow -\infty, f(x) \rightarrow +\infty$

1 Back to 5
 2 By 96 Pick 8
 3 Pick any

done

Find the difference.

$$\begin{array}{r} (3x^4 + 4x^3 - 6x + 10) - (x^3 + 3x^2 + 2x + 6) \\ \underline{3x^4 - 4x^3 - 3x^2 - 4x + 4} \\ 3x^4 - 7x^3 - 3x^2 - 8x + 4 \\ (-2x^3 - 7x^2 + 5x - 6) - (-5x^3 + x^2 + 5x - 12) \\ \underline{-2x^3 - 12x^2 - 10x + 6} \\ 3x^3 - 5x^2 - 5x + 12 \end{array}$$

GUIDED PRACTICE

Find the product. Use the method of your choice.

4. $(x^2 + 5x + 3)(x + 2)$

$$\begin{array}{r} x^3 + 5x^2 + 3x \\ \underline{2x^2 + 10x + 6} \\ x^3 + 7x^2 + 13x + 6 \end{array}$$

5. $(3y - 4)^2$

$$9y^2 - 24y + 16$$

6. $(4b - 5)(b - 2)$

$$4b^2 - 18b + 10$$

Find the sum. Write the answer in standard form.

$(2x^2 - 4x + 1) + (-7 + 3x^2)$

$$5x^2 - 4x - 6$$

$$\begin{array}{r} 2x^6 - x^5 + 5x^3 - 4x^2 + 3 + (5x^5 - x^4 + 6x^3 + 3x^2 + 2) \\ \underline{2x^6 + 4x^5 - x^4 + 3x^2 + 5} \\ 2x^6 + 4x^5 - x^4 + 11x^3 - x^2 + 5 \end{array}$$