

Name: _____

Date: _____

CC ALGEBRA 2

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UNIT 2 REVIEW: SOLIVING POLYNOMIALS

1) Solve the equation by completing the square and leave your answer in *simplest radical form*.

a. $x^2 - 6x - 3 = 0$

Solve the equation by completing the square.

b. $3x^2 - 9x = -6$

2) Solve the following equation using the quadratic formula to the simplest radical form.

$$3x^2 - 3x + 7 = 9x + 3$$

3) Find all solutions to $x^3 + 3x^2 - 9x - 27 = 0$ algebraically and state their multiplicities.

4) Factor each expression COMPLETELY.

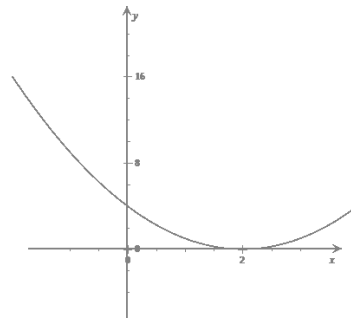
a) $x^3 - 125$

b) $2x^4 + 16x$

For #5-6, a polynomial function and its graph are given. Answer the questions provided

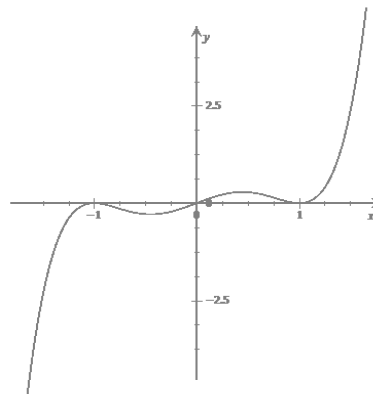
5) $f(x) = (x - 2)^2$

- a) State the degree: _____
- b) What are the zero(s)? _____
- c) What is the multiplicity of the root?



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

- a) State the degree: _____
- b) What are the zeros? _____
- c) What are the multiplicities of each root?



7) Consider the polynomial function $y = 5 - 3x^2 - 2x^3$.

a) Write the function in standard form. _____

b) What is the degree of this function? _____

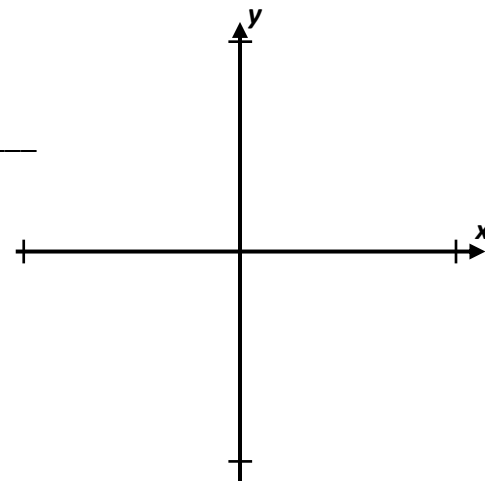
c) What is the leading coefficient? _____

d) How many distinct zeros could this function have? _____

e) What is the end behavior of the graph of this function?

f) Sketch the function on the graph provided.

e) Is the function odd, even, or neither? Explain.



8) Consider the polynomial function $y = x^4 - 26x^2 + 25$

a) What is the degree of this function? _____

b) What is the leading coefficient? _____

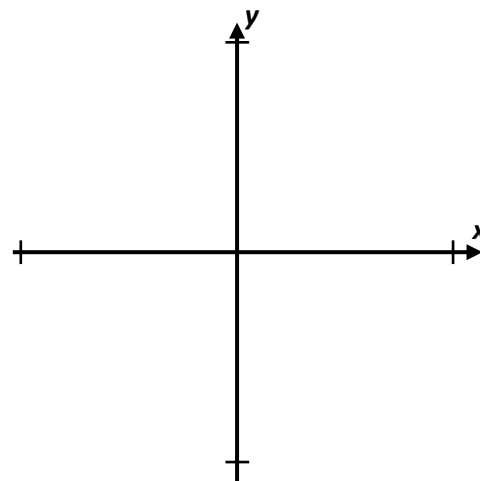
c) How many distinct zeros could this function have? _____

d) Find the zeroes of this function algebraically.

e) What is the end behavior of the graph of this function?

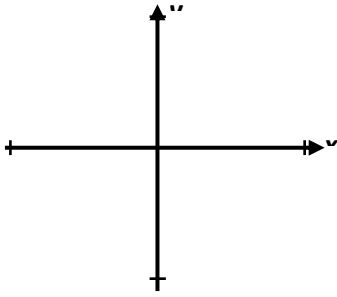
f) Is the function odd, even, or neither? Explain graphically and justify algebraically.

g) Sketch the function on the graph provided.

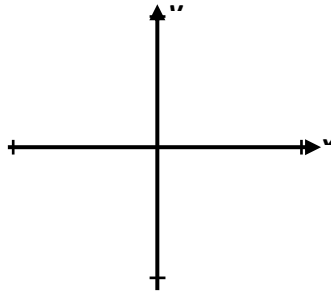


9) After sketching the graph, determine if the following functions are even, odd, or neither.

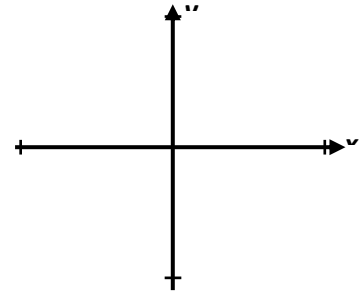
a) $f(x) = (x + 4)^2(x - 4)^2$



b) $f(x) = (x - 2)^3$



c) $f(x) = -2x(x^2 - 16)$



10) For each problem, express the quotient as a polynomial with a remainder as a rational expression.

a) $\frac{3x-9}{x-2}$

b) $\frac{x^2-5x+2}{x-7}$

c) $\frac{x^3-9x^2+5x+2}{x-1}$

d) $(x^3 + 5x - 8) \div (x + 2)$

11) Determine if the following function is even, odd, or neither. Justify algebraically.

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

12) Consider the polynomial function: $P(x) = 2x^3 + 3x^2 - 2x - 3$.

a) Does $P(-1) = 0$? If so, what must one of the factors of P be?

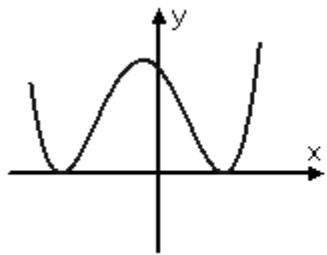
b) Find the remaining two factors of P .

13) Show that $x^{51} - 21x + 20$ is divisible by $x - 1$ using the remainder theorem.

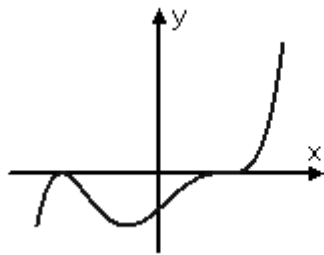
14) If $3x^3 - 13x^2 + 15x - 7$ is divided by $x - 2$, use the remainder theorem to find the remainder.

15) Find the value k so that $(kx^3 + x - k) \div (x + 2)$ has remainder of 16.

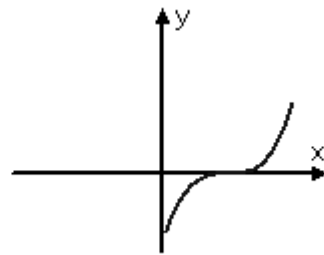
16. Which of the following graphs could represent the polynomial $f(x) = a(x-b)^2(x-c)^3$?



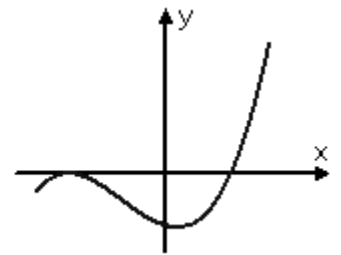
(1)



(2)



(3)



(4)

17. Which end behavior is associated with a function that has a leading positive term with an odd exponent?

(1) Up/up

(2) Down/down

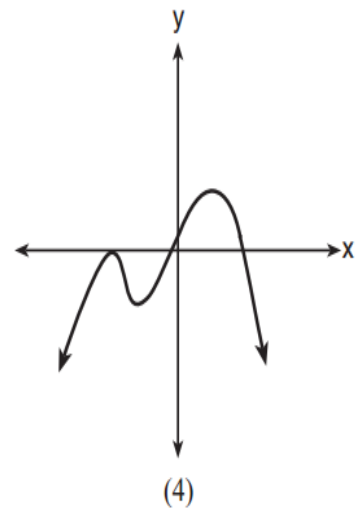
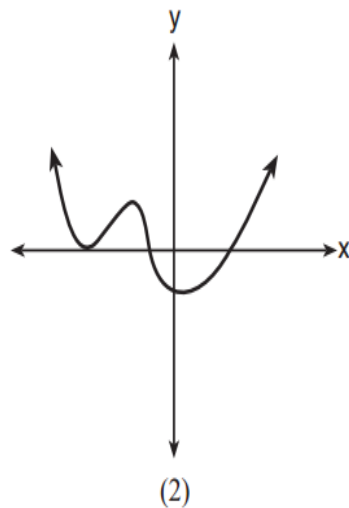
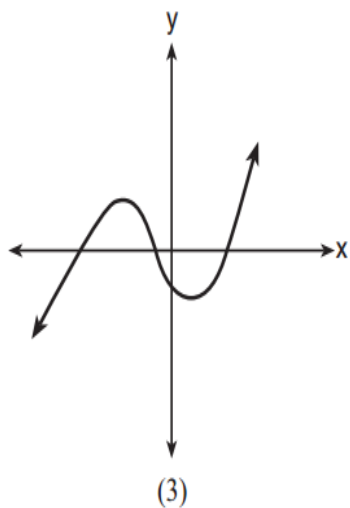
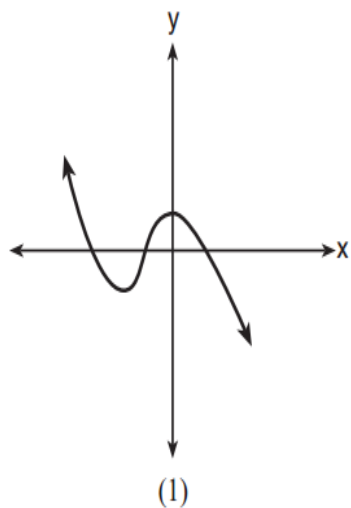
(3) Up/down

(4) Down/up

18.

Which graph has the following characteristics?

- three real zeros
- as $x \rightarrow -\infty$, $f(x) \rightarrow -\infty$
- as $x \rightarrow \infty$, $f(x) \rightarrow \infty$



19. The graph of a polynomial function $f(x)$ is illustrated to the right.

a. What is the remainder when $f(x)$ is divided by $(x - 1)$?

b. What is the remainder when $f(x)$ is divided by $(x + 3)$?

