Algebra II **REVIEW WS – Unit 5 QUIZ #1** **Name** KEY **Prd**_____

Analyzing & Sketching Polynomial Functions including Factoring

1. Which describes the end behavior of $f(x) = -4x^2 + 1$?

A) as $x \to -\infty, f(x) \to -\infty$ and as $x \to +\infty, f(x) \to +\infty$

B) as $x \to -\infty, f(x) \to +\infty$ and as $x \to +\infty, f(x) \to -\infty$

C) as $x \to -\infty, f(x) \to +\infty$ and as $x \to +\infty, f(x) \to +\infty$

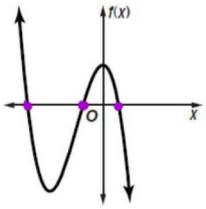
D) as $x \to -\infty, f(x) \to -\infty$ and as $x \to +\infty, f(x) \to -\infty$

⊖ Even ↓ ↓

2. State the number of real zeros for the function whose graph is shown at the right.

A. 0 **B.** 2

C. 3 **D.** 1



3. State the number of turning points. What is the degree of the function?

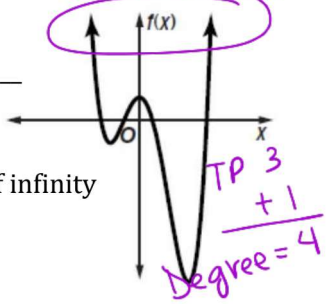
MAX of 3 Turning Points

Sign on LC (***a***) ⊕ Degree 4

Write the End Behavior in terms of infinity

$x \to -\infty, y \to +\infty$

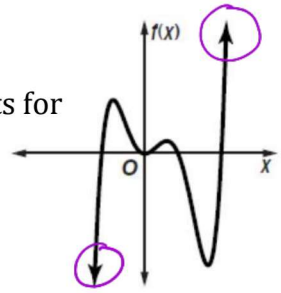
$x \to +\infty, y \to +\infty$



⊕ up Even

TP 3 + 1 = Degree = 4

4. Complete the statements for the graph provided.



⊕ odd ↓ ↑

Number of MAX Turning Points 4 + 1

Sign on LC (***a***) ⊕ Degree 5

as $x \to$ $-\infty$, $y \to$ $-\infty$

as $x \to$ $+\infty$, $y \to$ $+\infty$

5. FACTOR the following expressions.

a) $x^5 - 81x$

$x(x^4 - 81)$ DOS

$x^2 \quad 9$

$x(x^2+9)(x^2-9)$ DOS

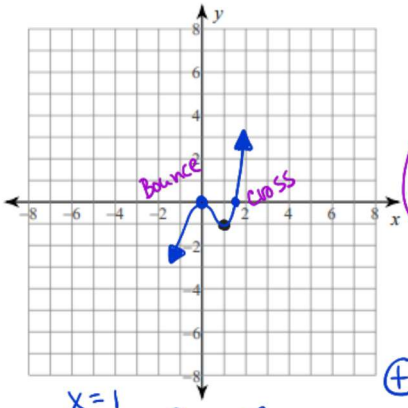
$x(x^2+9)(x+3)(x-3)$

b) $x^4 + x^3 - 4x^2 - 4x$

$x(x+2)(x-2)(x+1)$

6. GRAPH each of the following functions with the basic shape of each graph. Show all work used to find the end behavior, the y-intercept, ALL the zeros (x-intercepts), their multiplicity and behavior at the x-axis (bounce or cross).

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



$0 = x^2(2x-3)$

$x^2 = 0$

$x = 0$ mult. 2 Even Bounce

$2x - 3 = 0$

$2x = 3$

$x = \frac{3}{2} = 1\frac{1}{2}$ mult 1 odd Cross

$f(0) = 0$

$x = 1$

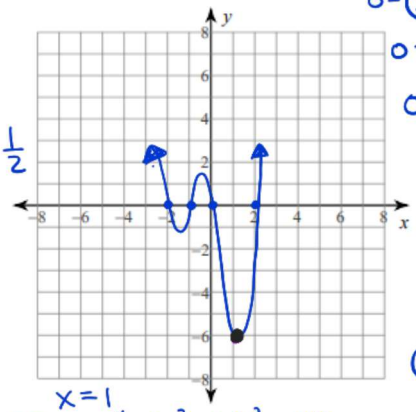
$f(1) = 2(1)^3 - 3(1)^2$

$= 2 - 3$

$f(1) = -1$

⊕ odd ↓ ↑ top

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



GCF

$0 = (x^3 - 4x)(x+1)$

$0 = x(x^2-4)(x+1)$

$0 = x(x+2)(x-2)(x+1)$

$x = 0, -2, 2, -1$ Each mult. 1

- odd
- Cross at each zero

$f(0) = 0$

⊕ Even ↑ ↑

$x = 1$

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

$= 1 + 1 - 4 - 4$

$f(1) = 2 - 8$

$f(1) = -6$

Practice Worksheet: End Behavior & Graphing Polynomials

WITHOUT graphing, identify the end behavior of the polynomial function. (HINT: Check for Standard Form)

7] $y = 2x^5 + 7x^2 + 4x$

MAX # of Turning Points (curves): 4

Sign of LC (*a*): + Degree: 5 odd

as x → − ∞, y → $-\infty$ ↓

as x → + ∞, y → $+\infty$ ↑

8] $y = -5x$

MAX # of Turning Points (curves): 0

Sign of LC (*a*): − Degree: 1 odd

as x → − ∞, y → $+\infty$ ↑

as x → + ∞, y → $-\infty$ ↓

9] $y = 12x^4 - 2x + 5$

MAX # of Turning Points (curves): 3

Sign of LC (*a*): + Degree: 4 Even

as x → − ∞, y → $+\infty$ ↑

as x → + ∞, y → $+\infty$ ↑

10] $y = 6 - 2x - 4x^2 + 5x^3$

Standard Form: $y = 5x^3 - 4x^2 - 2x + 6$

MAX # of Turning Points (curves): 2

Sign of LC (*a*): + Degree: 3 odd

as x → − ∞, y → $-\infty$ ↓

as x → + ∞, y → $+\infty$ ↑

11] $y = 1 + 2x^6 - 4x^2 - 2x^6$

Standard Form: $y = -4x^2 + 1$

MAX # of Turning Points (curves): 1

Sign of LC (*a*): − Degree: 2 Even

as x → − ∞, y → $-\infty$ ↓

as x → + ∞, y → $-\infty$ ↓

12] $y = 4x + 2 - 5x^6$

Standard Form: $y = -5x^6 + 4x + 2$

MAX # of Turning Points (curves): 5

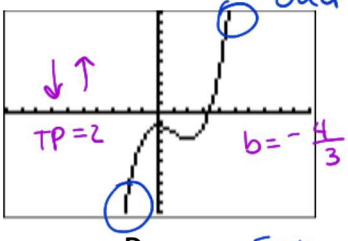
Sign of LC (*a*): − Degree: 6 Even

as x → − ∞, y → $-\infty$ ↓

as x → + ∞, y → $-\infty$ ↓

Match the polynomial function with its graph WITHOUT using a graphing calculator. Think about how the degree of the polynomial affects the shape of the graph.

A.



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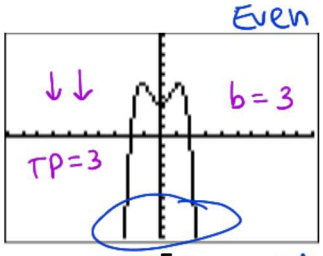

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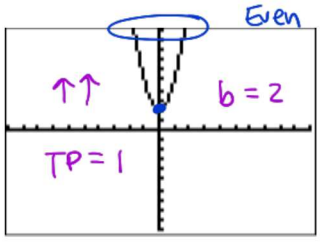

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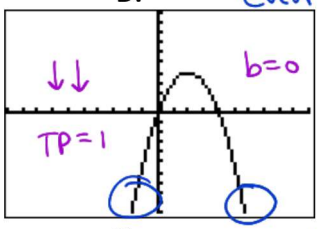

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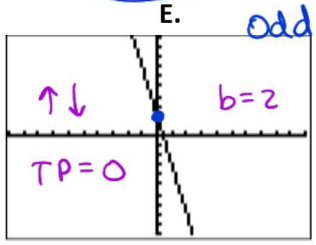

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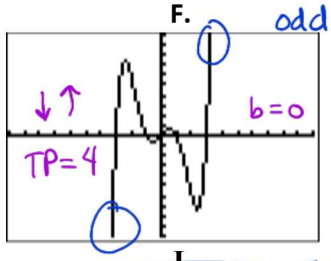

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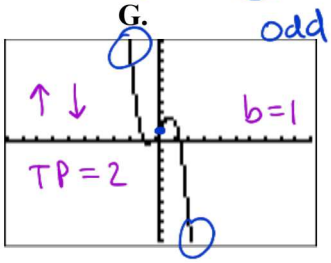
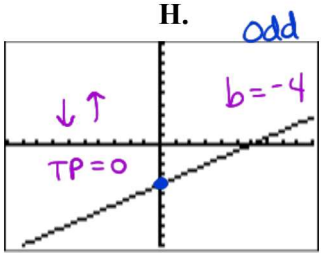
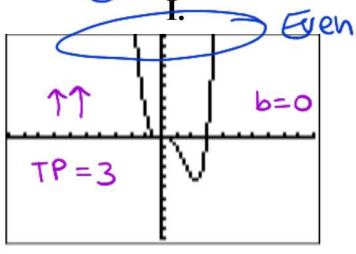


H.



I.



D 13] $y = -x^2 + 4x$ ↓ ↓ TP = 1

B 14] $y = -x^4 + 3x^2 + 3$ ↓ ↓ TP = 3

I 15] $y = \frac{1}{2}x^4 - \frac{3}{2}x^3$ ↑ ↑ TP = 3

G 16] $y = -2x^3 + 3x + 1$ TP = 2 ↑ ↓

C 17] $y = 3x^2 + 2$ ↑ ↑ TP = 1

F 18] $y = \frac{1}{5}x^5 - 2x^3 + \frac{9}{5}x$ ↓ ↑ TP = 4

A 19] $y = \frac{1}{3}x^3 - x^2 - \frac{4}{3}$ TP = 2 ↓ ↑

H 20] $y = \frac{2}{3}x - 4$ + odd ↓ ↑

E 21] $y = -5x + 2$ − odd ↑ ↓

Linear
Degree 1