For numbers 1-5, refer to the following graph of f(x).
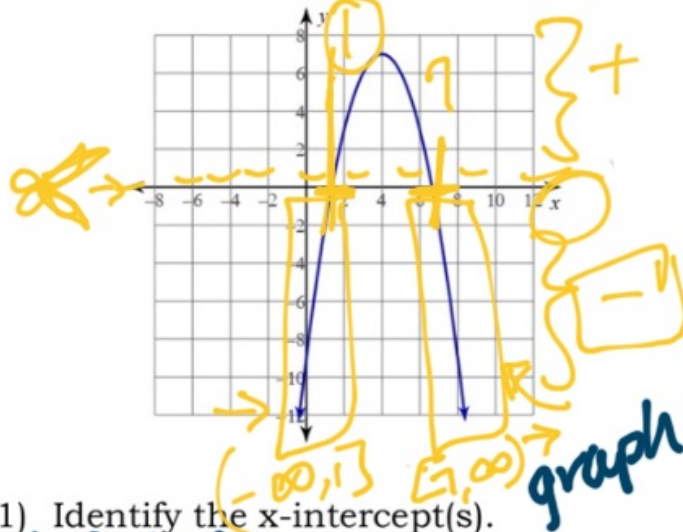

1) Identify the x-intercept(s).
   $(1,0)$ $(7,0)$

2) Identify the domain.
   $(-\infty, \infty)$ $\mathbb{R}$

3) Identify the range.
   $(-\infty, 7]$ $y \le 7$

4) Identify the Interval(s) of Increasing:
   $(-\infty, 4]$ $x \le 4$

5) Identify the Interval(s) of Negative:
   $(-\infty, 1]$ $[7, \infty)$

② Domain
x-values on graph.
left most
right most
$(-\infty, \infty)$ all real #s
$\mathbb{R}$

graph touches x-axis

③ Range Ⓨ-values
bottom to top
$(-\infty, 7]$

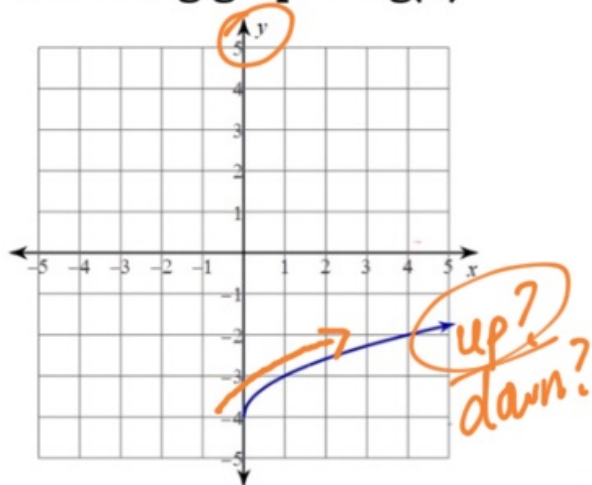④ where y-values are going up
what x-values do this?

⑤ x-values that make y negative

For numbers 6-10, refer to the following graph of g(x).

up? down?

6) Identify the y-intercept(s): $(0, -4)$

7) Identify the domain: $[0, \infty)$ $x \geq 0$

8) Identify the range: $[-4, \infty)$ $y \geq -4$

9) Identify the Interval(s) of Increasing: $(0, \infty)$ $x \geq 0$

10) As $x \to \infty$, $y \to$ ___ ∞ ___ (right)

⑥ where the graph touches y-axis

⑦ Domain: x-values left to right

⑧ Range: y-values bottom to top
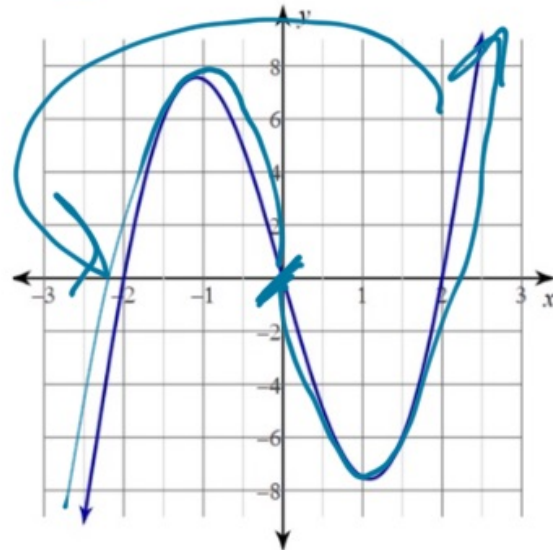
⑨ increasing what x-values make y go up

⑩ end behavior

11) What makes a function an even function? **symmetry over y-axis**

What makes a function an odd function? **rotational symmetry about the origin**

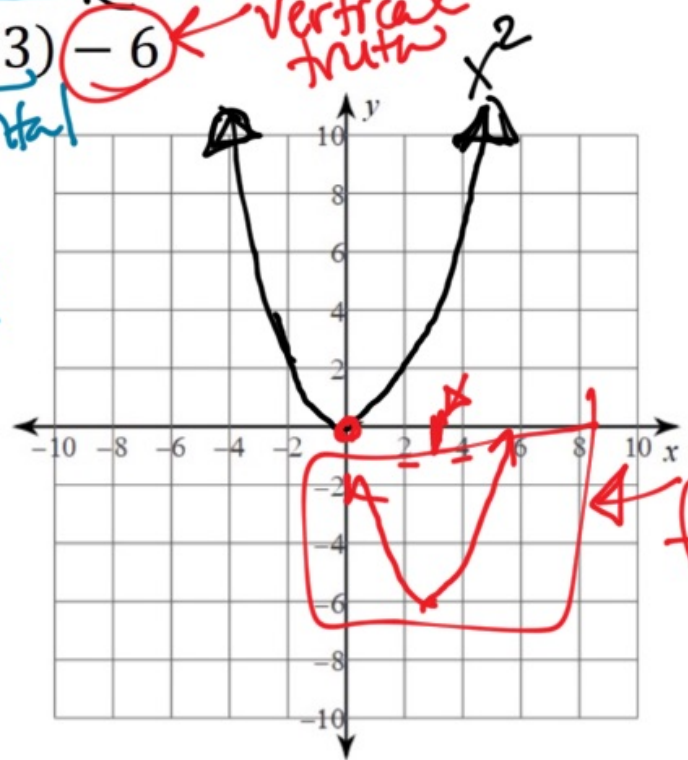12) How is the following function classified: Even, ~~Odd,~~ or Neither?

13) Assuming the parent function $f(x) = x^2$, sketch the function

$f(x-3) - 6$

right 3
down 6

vertical truth
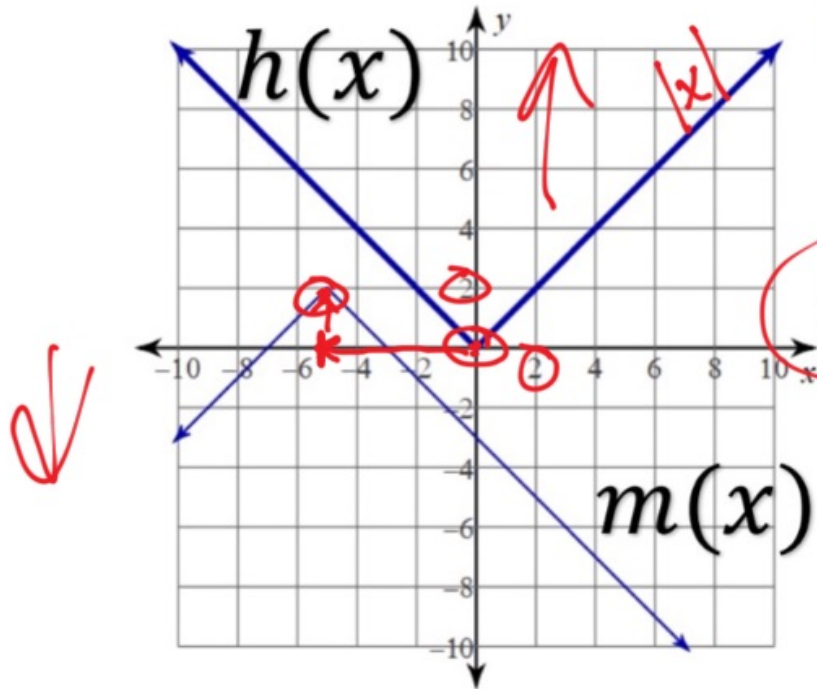
horizontal lies

−3 left?

lies!

right

$f(x-3) - 6$

14) The graph for h(x) and m(x) are shown below. Given that $h(x) = |x|$, what is the equation for m(x)?

$h(x)$
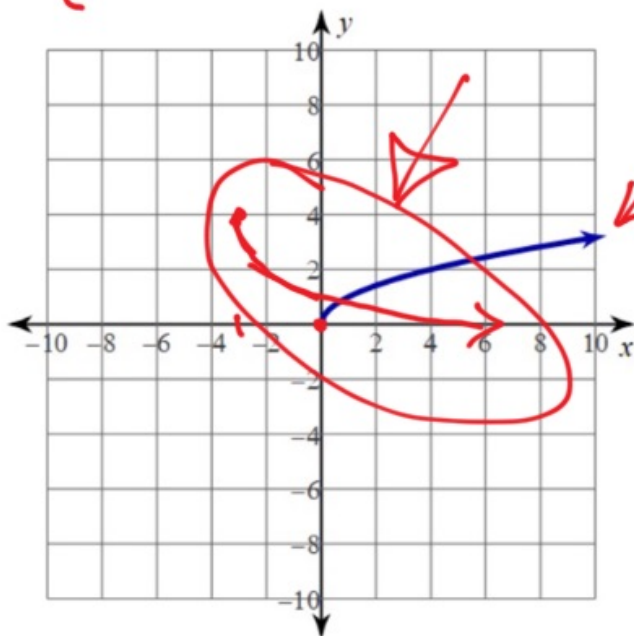
$m(x)$

x (lies)
horiz inside

left 5
up 2
flip
} vert outside

neg.

$m(x) = -|x+3| + 2$

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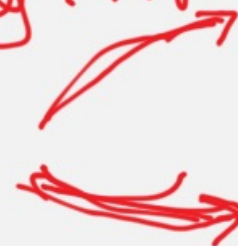15) Assuming parent function $g(x) = \sqrt{x}$, sketch the transformation

$-g(x + 3) + 4$

$+3$ horizontal b/c inside (lies) $=$

$g(x)$ $+4$ outside vertical truth

neg → flip

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16) Determine the degree of the following polynomial: **5th**

$$h(x) = x^5 + x^3 + 5x^2 - 2x + 4$$

17) Determine the degree of the following polynomial: **9th**

$$p(x) = -7x^9 - 5x^6 + 4x^3 + 2x - 3$$

18) Determine the degree of the following polynomial: **6th**

$$k(x) = (x+2)^3(x - 4)^2(x - 2)$$
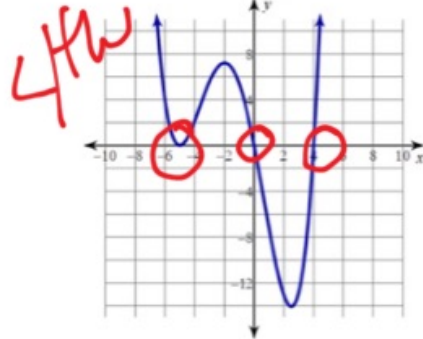
$$\rightarrow x^3 x^2 x^1 = x^6$$

19) Determine the degree of the following polynomial: **3rd**

$$b(x) = (x - 6)^2(x + 5)$$

$$\rightarrow x^2 x^1 = x^3$$

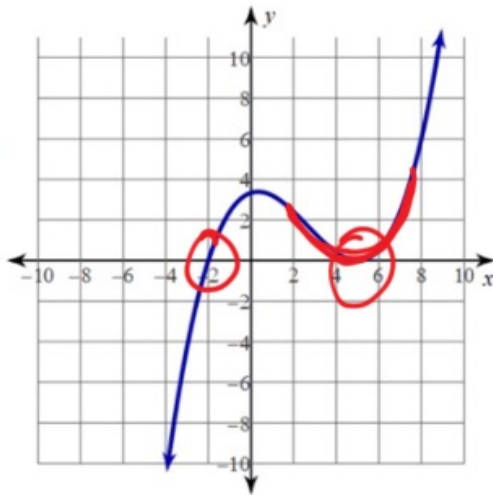20) What could the degree be for the graph below? **4th**

Degree –

highest exponent on x

$$x^3 x^2 x^1 = x^6$$

$$x^2 x^1 = x^3$$

x-intercepts?
(4,0) (0,0) (-5,0)
← bounce
mult of 2

2

21) What could the degree be for the graph below?

3rd

x-int.

(-2,0) (5,0)
        bounce
        mult 2

22) Determine the y-intercept of the following polynomial:

(0,7)

$$h(x) = 8x^5 + 2x^3 - 4x + 7$$

23) Determine the y -intercept of the following polynomial:
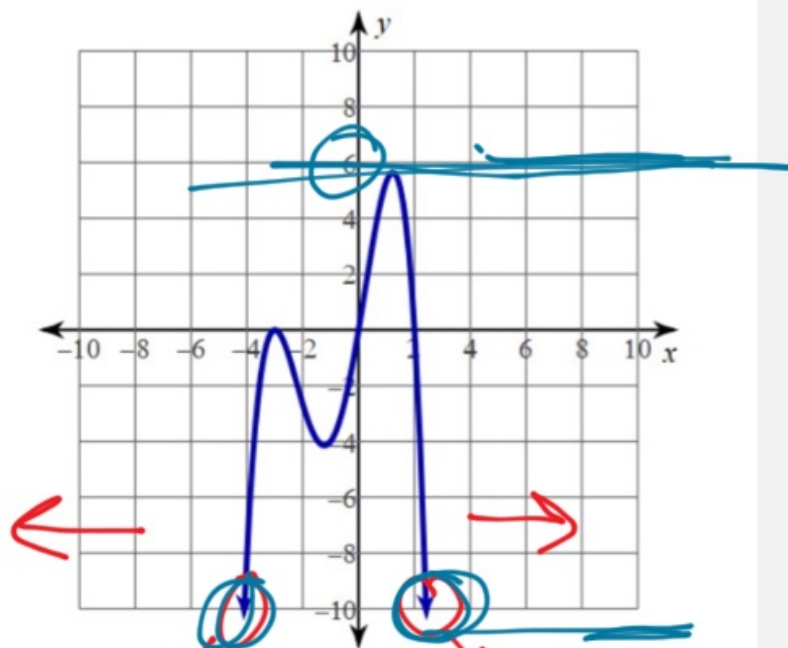
(0,-12)

$$k(x) = (x + 2)^2(x - 3)$$

$-2 \cdot -2 \cdot -3$
$4x-3$ -12

For numbers 24 & 25 refer to the following graph of f(x).

24) What is the domain of f(x)? $(-\infty, \infty)$, $\mathbb{R}$

25) What is the range of f(x)? $(-\infty, 6]$ $y \leq 6$

26) Determine the x-intercept(s) of the following polynomial:

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

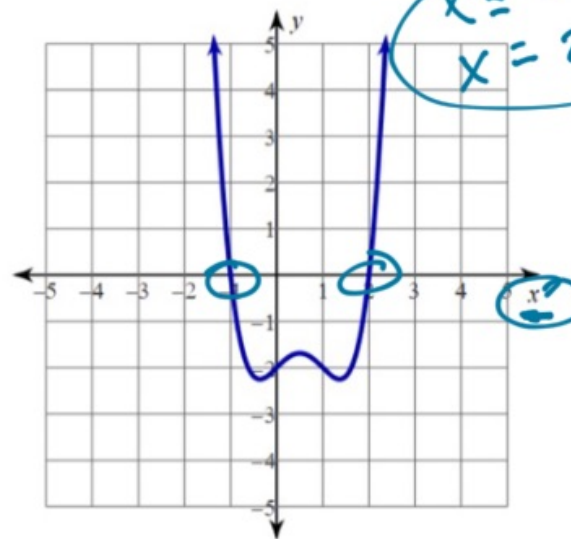$(-2, 0) \quad (4, 0) \quad (2, 0)$

27) Determine the zero(s) of the following polynomial:

$$k(x) = (x + 2)^2(x - 3)$$

$x = -2, 3$

$x = -2, \ x = 3$

28) Determine the zero(s) of f(x) from its graph below.

$x = -1$
$x = 2$