

1.46 - Worksheet - Absolute Values and Reciprocal Functions**Part 1 - 7.1 Absolute Value**

Q1: Evaluate the following expressions:

$$|9 - 3|$$

$$|6|$$

$$6$$

$$|5 - 11| + 4$$

$$|-6| + 4$$

$$6 + 4$$

$$10$$

$$9 - 3|9 - 5^2|$$

$$9 - 3|9 - 25|$$

$$9 - 3|-16|$$

$$9 - 3(16)$$

$$9 - 48$$

$$-39$$

Q2: The expression $6 - |7 - 3^2|$ evaluates to _____.

(Record your answer in the Numerical Response boxes below)

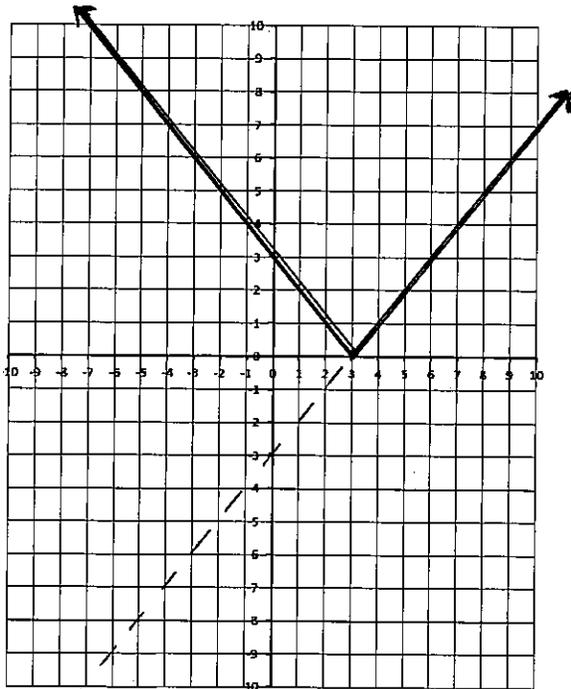
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$$6 - |7 - 9|$$

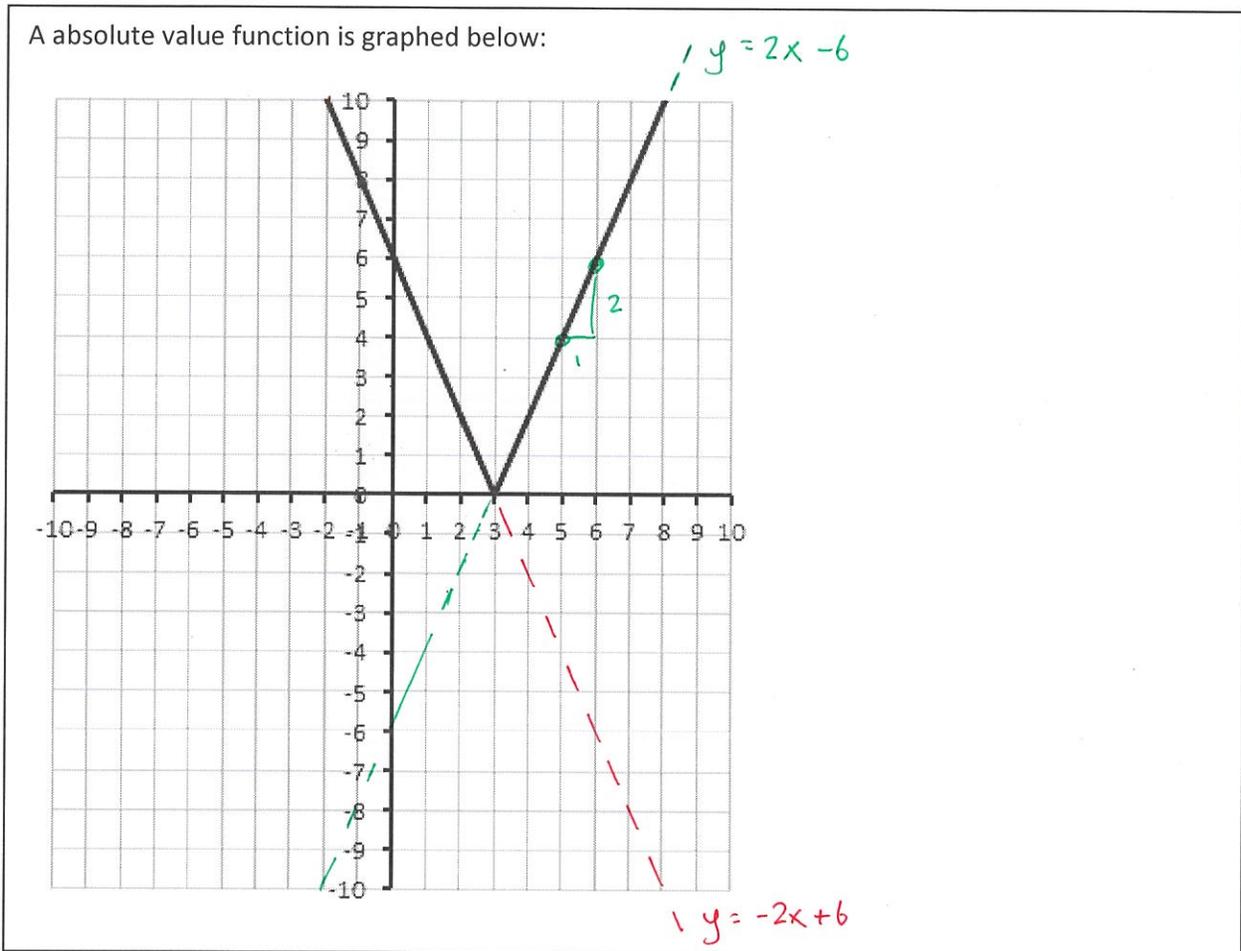
$$6 - |-2|$$

$$6 - 2$$

$$4$$

Part 2 - 7.2 Absolute Value FunctionsQ3: Graph $y = |x - 3|$ 

Use the following information to answer Q4:



Q4: A piecewise function can be written for this function as

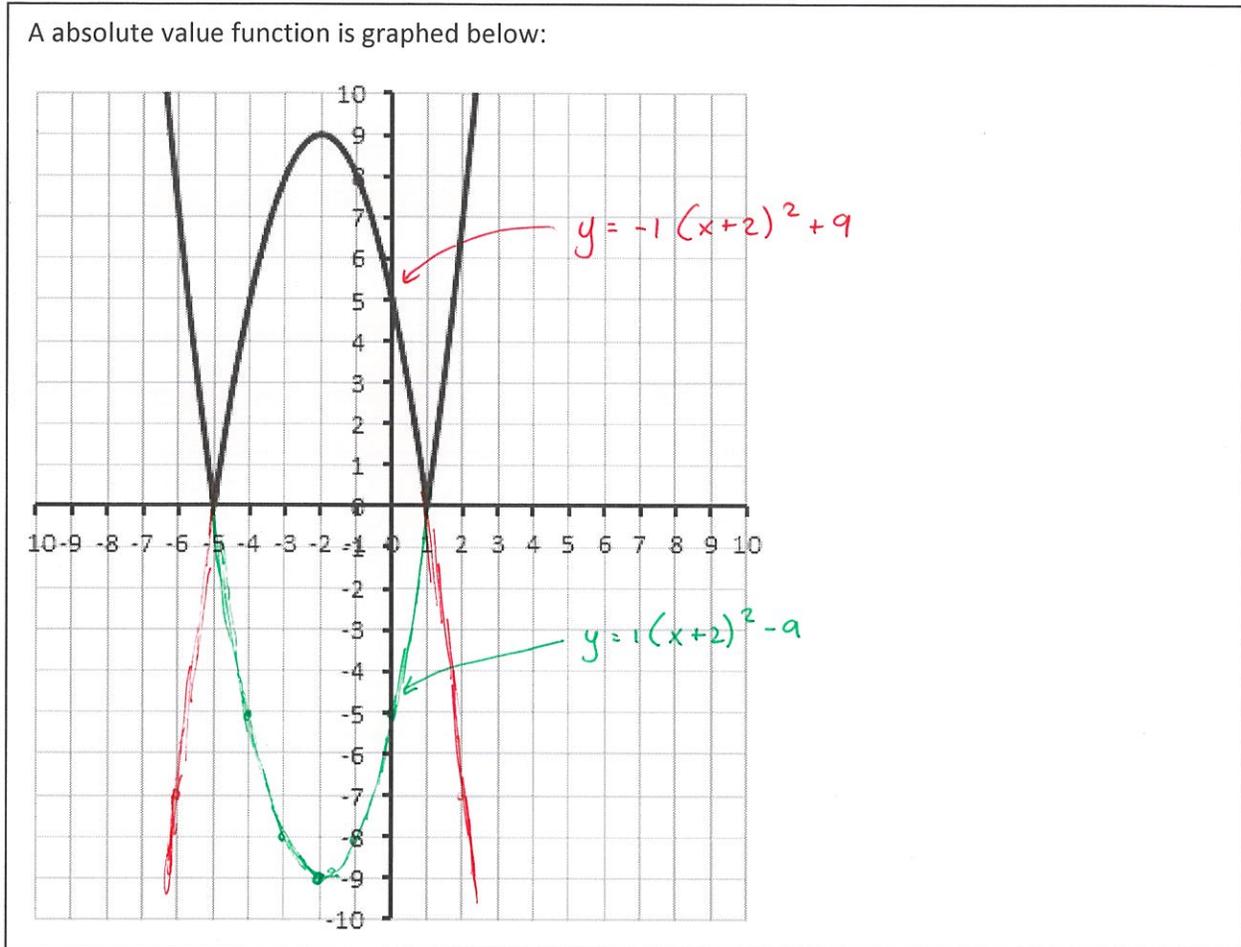
$$f(x) = \begin{cases} -2x + 6, & x < 3 \\ 2x - 6, & x \geq 3 \end{cases}$$

Where **a**, **b**, **c**, and **d** are __, __, __, and __.

(Record your **four digit** answer in the Numerical Response boxes below)

2	6	2	6
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Use the following information to answer Q5:



Q5: A piecewise function can be written for this function as

$$f(x) = \begin{cases} 1(x+2)^2 - 9 & x < -5, x > 1 \\ a(x+b)^2 - c, & -5 \leq x \leq 1 \\ -1(x+2)^2 + 9 & \end{cases}$$

Where a , b , and c are __, __, __, and __.

(Record your **three digit** answer in the Numerical Response boxes below)

1	2	9
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Part 3 – 7.3 Absolute Value Equations

Q6: Solve $|x^2 + 2x - 8| = x + 4$ algebraically. Verify your answers. Confirm by graphing.

$$+(x^2 + 2x - 8) = x + 4$$

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

$$\begin{array}{r} -x \quad -4 \quad -x \quad -4 \\ \hline \end{array}$$

$$x^2 + x - 12 = 0$$

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

$$\textcircled{A} x = -4 \quad \textcircled{B} x = +3$$

$$-(x^2 + 2x - 8) = x + 4$$

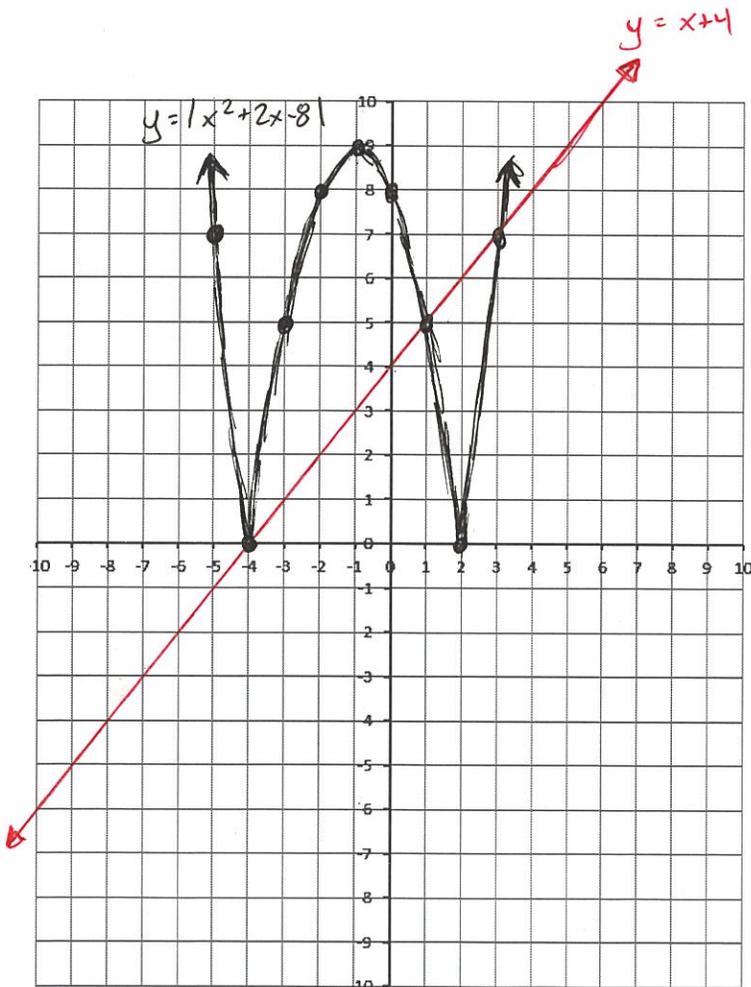
$$-x^2 - 2x + 8 = x + 4$$

$$\begin{array}{r} +x^2 \quad +2x \quad -8 \quad +x^2 + 2x - 8 \\ \hline \end{array}$$

$$0 = x^2 + 3x - 4$$

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

$$\textcircled{A} x = -4 \quad \textcircled{C} x = 1$$



VERIFY

$$\textcircled{A} |(-4)^2 + 2(-4) - 8| = (-4) + 4$$

$$|16 - 8 - 8| = 0$$

$$|0| = 0$$

Yes!

$$\textcircled{B} |(3)^2 + 2(3) - 8| = (3) + 4$$

$$|9 + 6 - 8| = 7$$

$$|7| = 7$$

Yes!

$$\textcircled{C} |(1)^2 + 2(1) - 8| = (1) + 4$$

$$|1 + 2 - 8| = 5$$

$$|-5| = 5$$

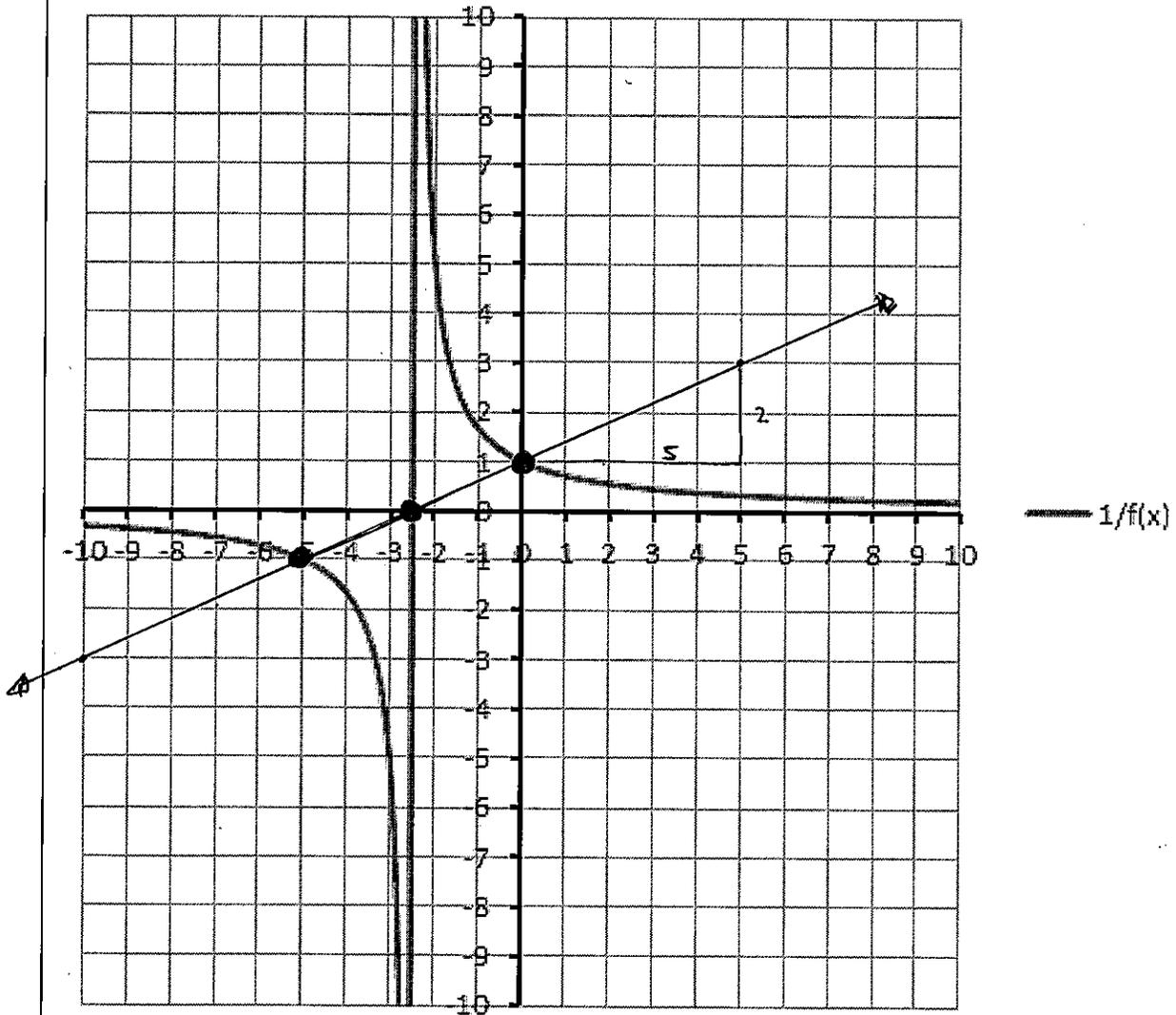
Yes!

Solns are $x = -4, 1, 3$

Part 4 – 7.4 Reciprocal Functions

Use the following information to answer Q7:

The graph below depicts an inverse function, $y = \frac{1}{f(x)}$



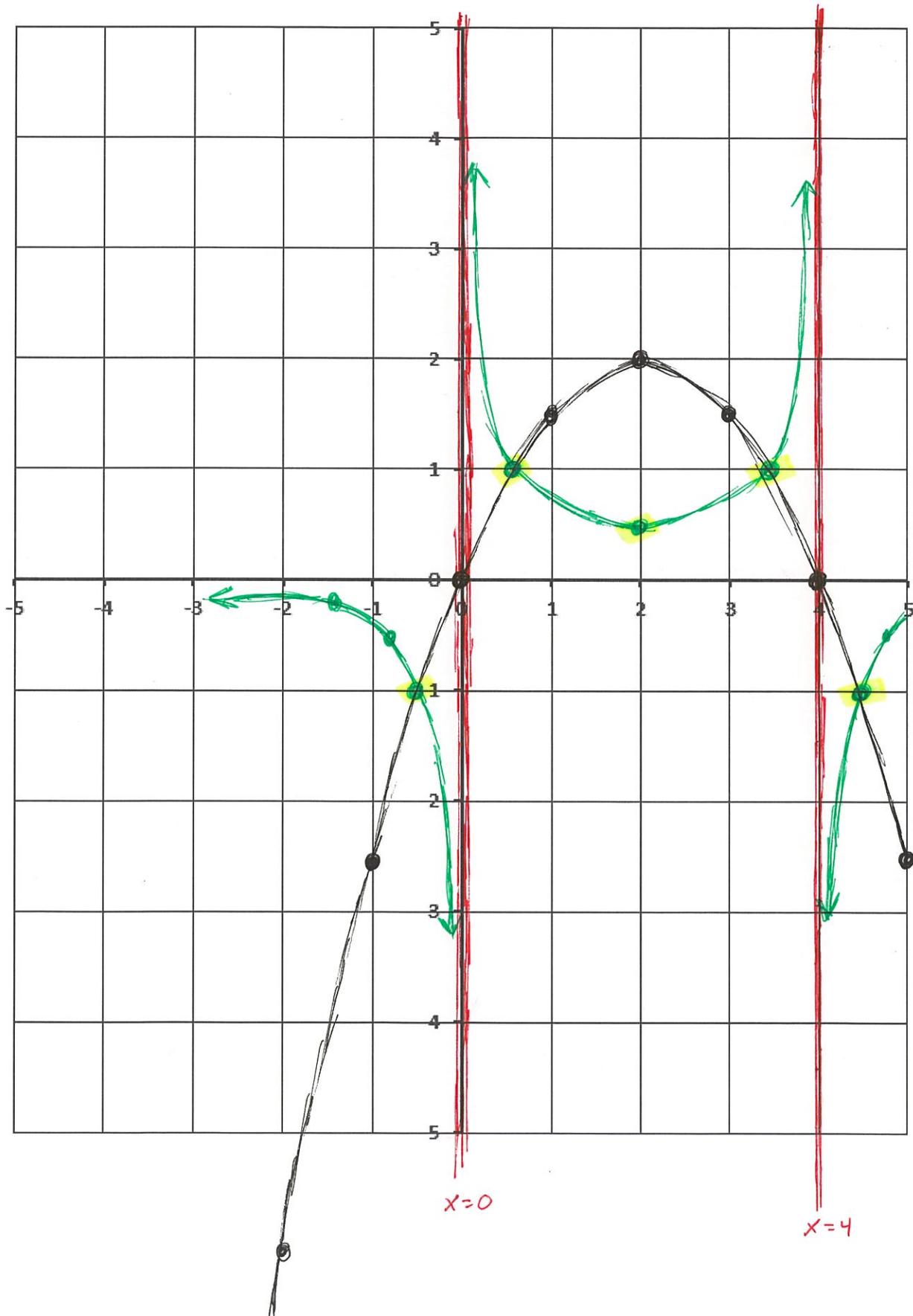
Q7: The original function can be written as $f(x) = \frac{a}{b}x + c$, where a , b , and c are __, __, and __.

(Record your **three digit** answer in the Numerical Response boxes below)

2	5	1	
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$$y = \frac{2}{5}x + 1$$

Q8: If $f(x) = -\frac{1}{2}x^2 + 2x$, graph the reciprocal function $y = \frac{1}{f(x)}$



Q9: A student is building a table of values to graph a reciprocal function. Complete the table.

x	$y = f(x)$	$y = \frac{1}{f(x)}$
0	-8	$\frac{1}{-8} = -0.125$
1	-5	$\frac{1}{-5} = -0.2$
2	0	$\frac{1}{0}$ NPV
3	7	$\frac{1}{7} = 0.\overline{142857}$