ALGEBRA II ASSESSMENT ANALYSIS – SOL ALIGNMENT AND COGNITIVE DEMAND

STANDARD AII.7

The student will investigate and analyze functions algebraically and graphically. Key concepts include

a) **domain and range, including limited and discontinuous domains and ranges;**
b) **zeros;**
c) ***x*- and *y*-intercepts;**
d) **intervals in which a function is increasing or decreasing;**
e) **asymptotes;**
f) **end behavior;**

Graphing calculators will be used as a tool to assist in investigation of functions.

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1. **What is the zero of** $f(x) = 2\sqrt{x+2} - 6$ **?**

   x **= _____**

2. **Identify all the asymptotes of the function, f(x) =** $\dfrac{x^3 - 1}{2x^2 - 2}$ **.**

   a) $x = -1,\ y = 0$

   b) $x = -1,\ y = \frac{1}{2}x$

   c) $x = -1,\ y = \frac{1}{2}x,\ y = 0$

   d) $x = -1,\ y = -1,\ y = 0$

3. **The graph of a function, g(x), is defined below. Select all intercepts from the choices provided.**

g(x) = $\begin{cases} x^2 - 4x - 5, \{x \mid x \le 4\} \\ 2x - 13, \{x \mid x > 4\} \end{cases}$

(-5, 0)	**(0, -1)**	**(6.5, 0)**
(0, -6)	**(4, -5)**	**(-6, 0)**
(-1, 0)	**(0, 6.5)**	**(0, -5)**

4. **Fill in the boxes below from the available choices so that the rational function, f(x), will have a vertical asymptote at x = -2, horizontal asymptote at y = 1, and a zero at x = 5.**

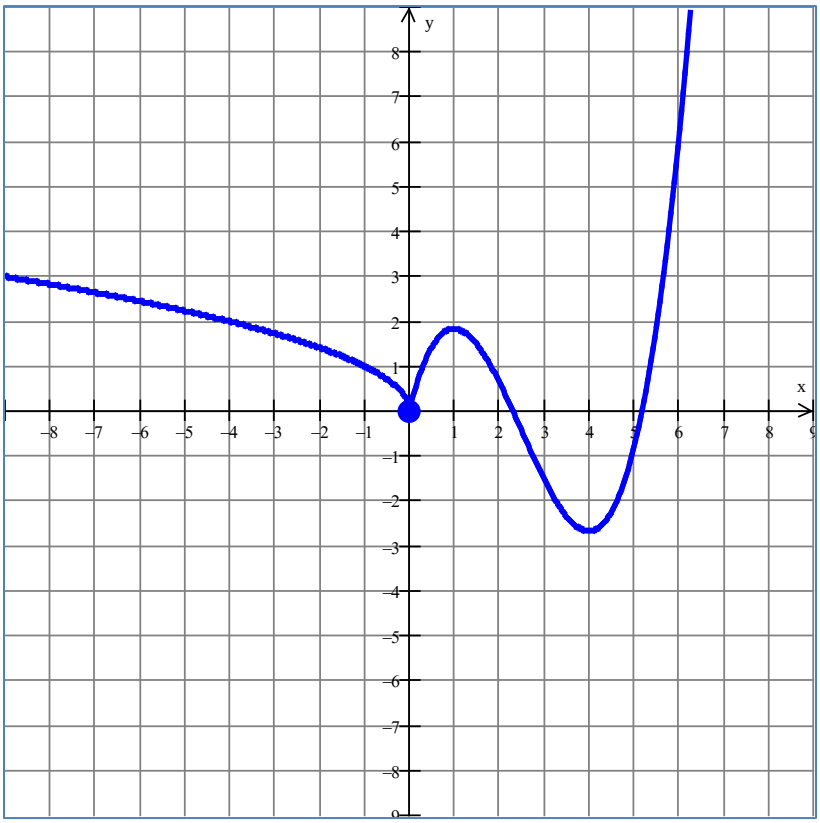
(x + 2)	**(x – 2)**	**(x + 1)**	**(x – 1)**	**(x + 5)**	**(x – 5)**

$$f(x) = \frac{\square}{\square}$$

5. **The zeros of a cubic function *g(x)* are $\frac{2}{5}$, 3, and -1. Select all the factors of *g(x).***

(5x – 2)	**(x – 3)**	**(x – 1)**
(5x + 2)	**(x + 3)**	**(x + 1)**

6. Given the graph below, determine the interval(s) where the function is decreasing.



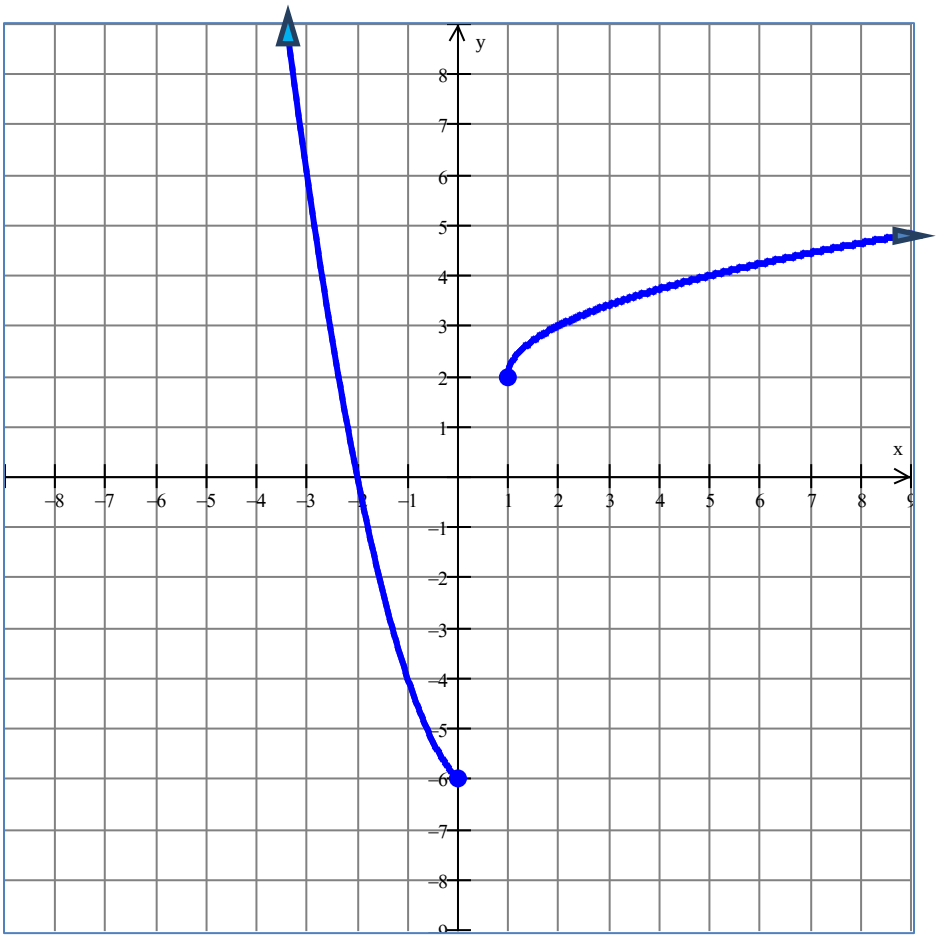
a) $\{x \mid 1 < x < 4\}$

b) $\{x \mid 2.3 < x < 5.2\}$

c) $\{x \mid x < 0\}$ and $\{x \mid 1 < x < 4\}$

d) $\{x \mid x \le 0\}$ and $\{x \mid 1 \le x \le 4\}$

7. The graph of a function is shown below. What appears to be the domain of this function?



a) $\{y \mid y \geq -6\}$

b) $\{x \mid x \leq 0\}$ an d$\{x \mid x \geq 1\}$

c) $\{x \mid x \leq -2\}$ an d$\{x \mid x \geq 1\}$

d) All real numbers

8. Select all of the following functions that have an end behavior that approaches *y* = 2 as *x* approaches positive infinity.

$f(x) = \log(x+2)+1$
$g(x) = \dfrac{2x-5}{x+2}$
$h(x) = \sqrt{x+3}-2$
$j(x) = 2$
$k(x) = \dfrac{3}{(x+1)^2}+2$