

+10
Quiz #4

Name Key

Directions: Please show all your work since partial credit is given. Answers without the necessary work will receive no credit. And remember to have fun!

1. The following questions are about the rational function $R(x) = \frac{3x^2}{2x^2 - 8}$.

+2 a) Find all the asymptotes of $R(x)$.

Horizontal: $y = \frac{3}{2}$

Vertical: $x = \pm 2$

Vertical: $2x^2 - 8 = 0$

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

$2(x-2) \cdot (x+2) = 0$

$x = 2$ or $x = -2$

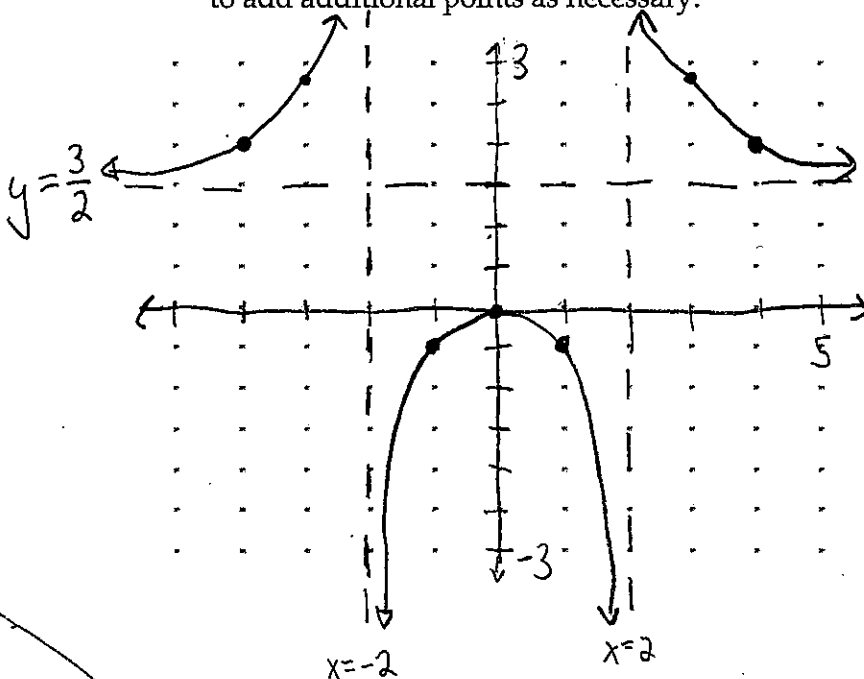
Horizontal:

$R(x) \approx \frac{3x^2}{2x^2} = \frac{3}{2}$ as $x \rightarrow \pm\infty$

+2 b) Describe the end behavior (as $x \rightarrow \pm\infty$) of the function $R(x)$. Make sure to use the appropriate notation.

$R(x) \rightarrow \frac{3}{2}$ as $x \rightarrow \pm\infty$

+2 c) Sketch a graph of $R(x)$, clearly labeling all asymptotes and intercepts. Don't forget to add additional points as necessary.



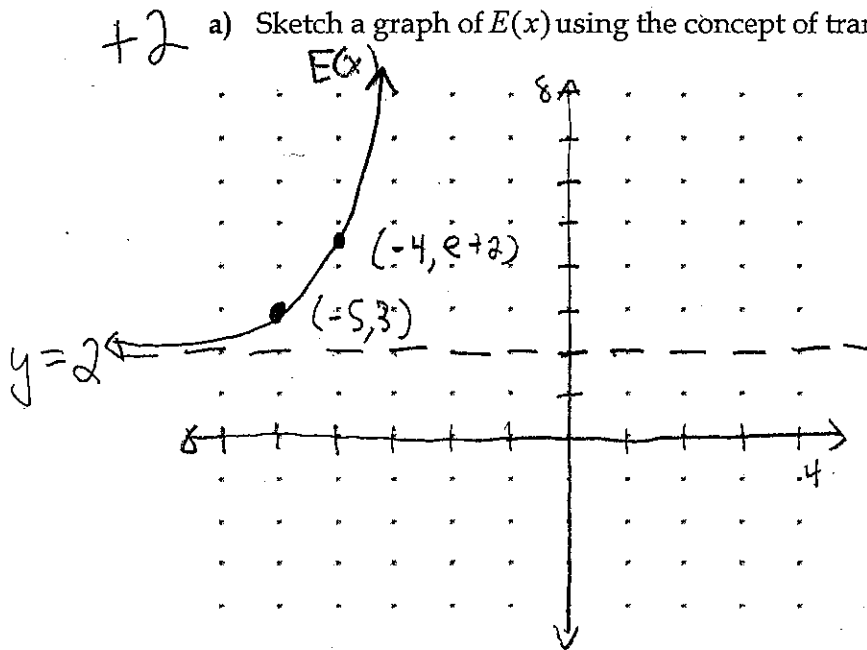
| x | y |
|----|------|
| -4 | 2 |
| -3 | 2.7 |
| -1 | -0.5 |
| 0 | 0 |
| 1 | -0.5 |
| 3 | 2.7 |
| 4 | 2 |

Note!
 $R(x)$ is an even function.

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2. The following questions are about the exponential function $E(x) = 2 + e^{x+5}$.

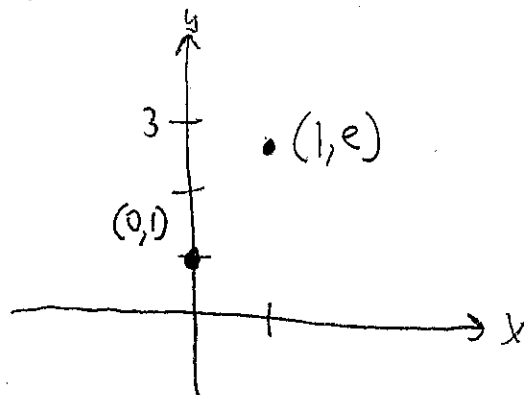
a) Sketch a graph of $E(x)$ using the concept of transformations.



Toolkit: $y = e^x$

(1) Horizontal Shift 5 units left

(2) Vertical Shift 2 units up.



$$(0, 1) \rightarrow (-5, 3)$$

$$(1, e) \rightarrow (-4, e+2) \approx (-4, 4.718)$$

b) State the domain and range of $E(x)$. Please use interval notation.

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Domain: All reals, \mathbb{R}

Range: $(2, +\infty)$ ← All y-values above the horizontal asymptote.

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