Unit 5 Study Guide

1) $\frac{10y+5}{4y+2} \cdot \frac{9y-3}{18y-6} =$

$$\frac{\boldsymbol{x^2-2x-8}}{\boldsymbol{2x^2-11x+5}} \div \frac{\boldsymbol{x^2-5x+6}}{\boldsymbol{2x^2-7x+3}}$$

2) $\frac{2x-8}{x^2+5x-36} \cdot \frac{x^2+14x+45}{4x-12}$

$$\frac{1}{x} - \frac{2}{x^2+2x}$$

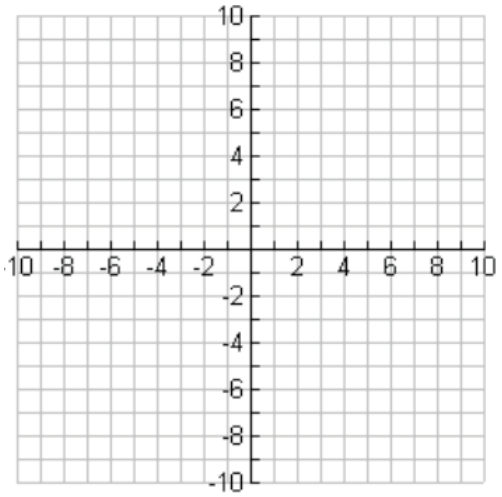
3) If you're in a canoe on a river and not paddling, you will travel the same direction and at the same speed as the river's current. When you paddle with the current (downstream), the canoe's speed is the sum of your paddling speed and the current's speed. When you paddle against the current (upstream), the canoe's speed is the difference of your paddling speed and the current's speed. Suppose you paddle a canoe at a steady speed of 2 miles per hour. You go 4 miles downstream and then 4 miles upstream to get back to where you started. The trip takes 9 hours.

Write an equation that would represent the total time it takes for your canoe trip.

Using your equation from above, determine the speed of the current. Show your work to justify your answer.

4. **Let $n(x) = \frac{1}{x-2} - 4$.** Describe the transformations from the parent function.

(b) Graph $n(x)$ on the given coordinate axes.



(c) Identify the domain and range.

(d) Identify the horizontal asymptote.

(e) Identify the vertical asymptote.

(f) Identify the end behavior.

5) Create a function f(x) that transforms the parent function h(x)=$\frac{1}{x}$ by shifting 2 units right and 3 units up.

Solve for x, identify any extraneous solutions.

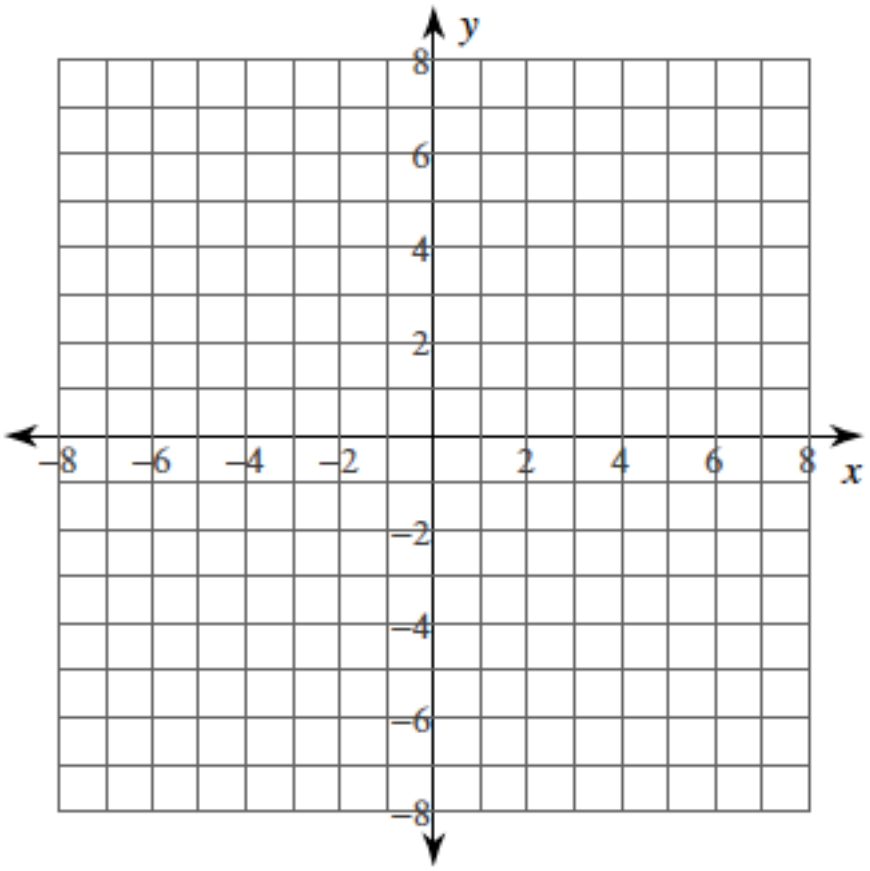
6) $\sqrt{2x+2} = -4$

$\sqrt{-x-2} = x+2$

$\sqrt{x+1} - 2 = 0$

$3(x+2)^{\frac{1}{2}} - 2 = 4$

Let f(x)=$\sqrt{x}$ and $g(x) = 2\sqrt{x-3} + 4$.
Graph both functions.



State the domain and range for g(x).

Describe the transformations to g(x) from the parent function.

Solve for x

$a)\ \frac{3}{x+2} - \frac{1}{5x} = \frac{2}{x}$

$b)\ \frac{2}{x} - \frac{4}{x+1} = 3$

$c)\ \frac{4}{x} + 7 = \frac{2}{3x}$