

Name: Answers Date: _____

MCR3U Quiz: 1.4, 2.1 – 2.6 Reciprocal functions, rational and radical expressions

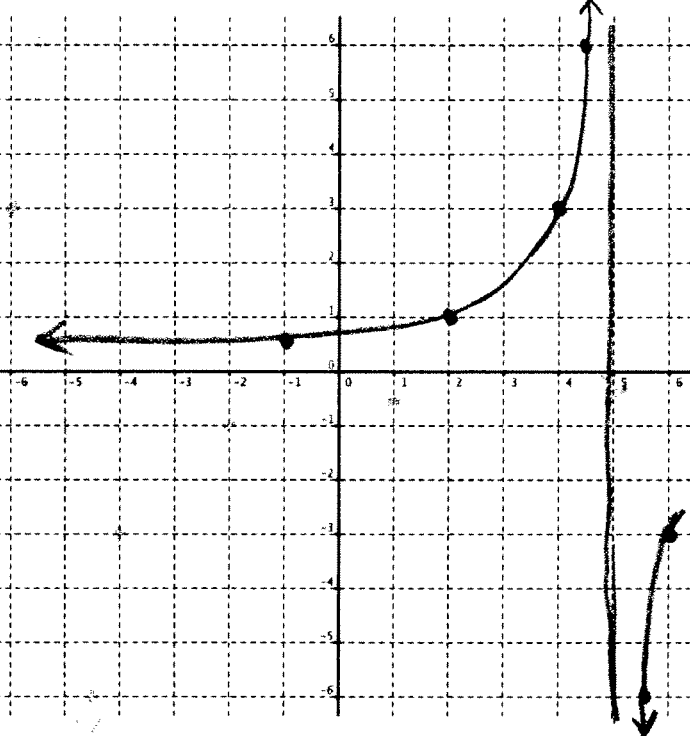
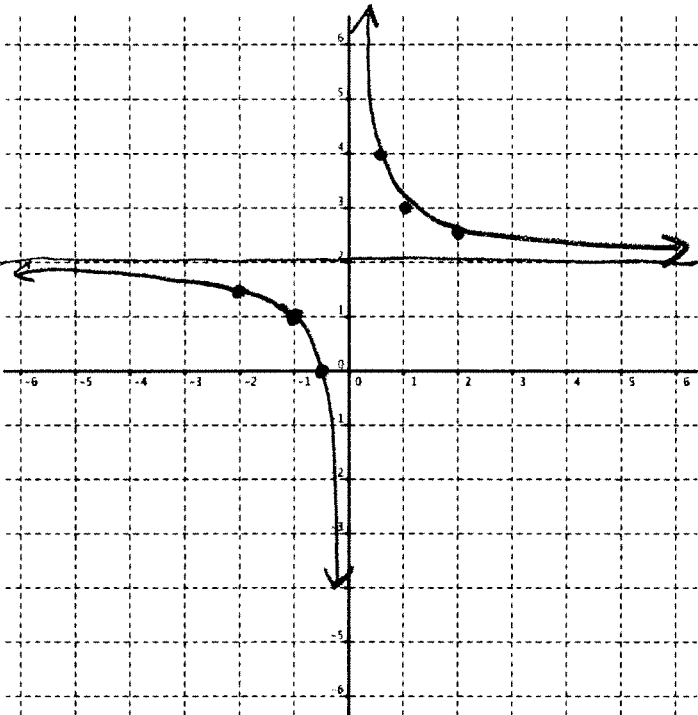
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1. Graph each of the following functions. Mark all points in the domain and range of the grid provided.

$$f(x) = \frac{1}{x} + 2$$

$$g(x) = \frac{3}{5-x} = \frac{3}{-x+5} = \frac{3}{-(x-5)}$$

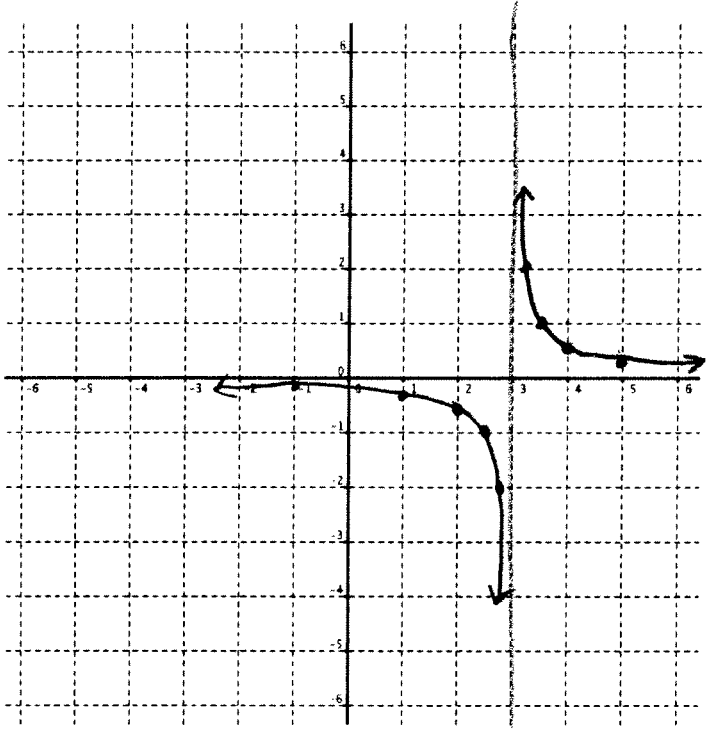


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2. Graph the reciprocal of the linear function $y = 2x - 6$.

$$y = \frac{1}{2x-6}$$

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



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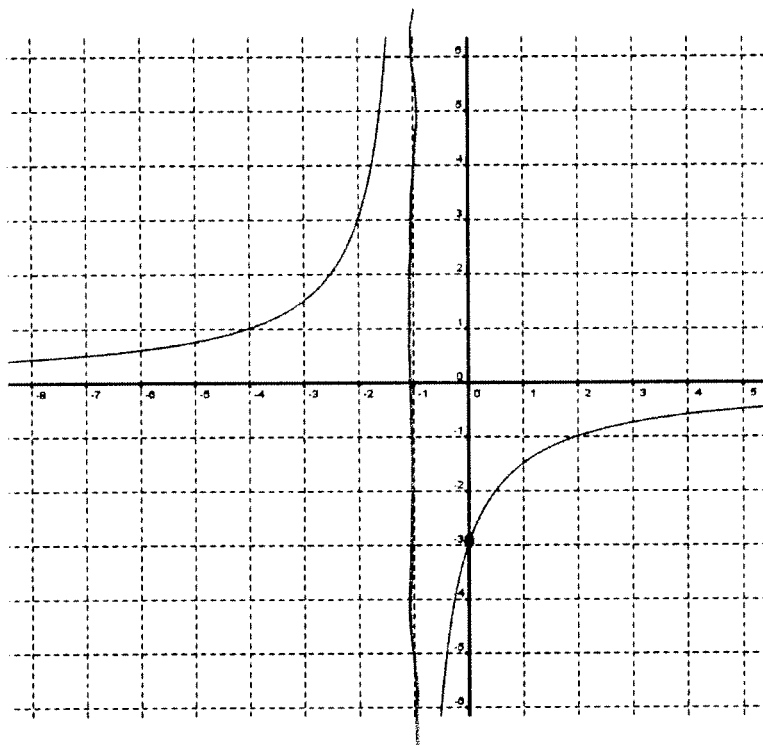
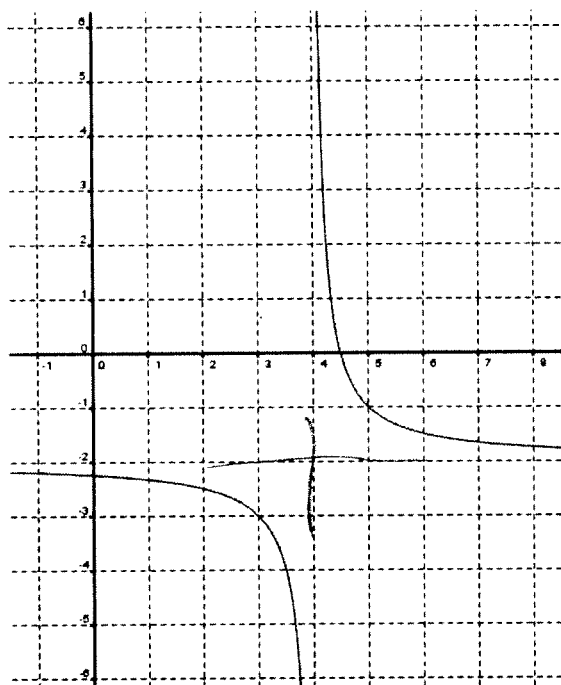
3. Determine equations for the functions shown in the graphs below.

a)

$$y = \frac{1}{x-4} - 2$$

b)

$$y = \frac{-3}{x+1}$$



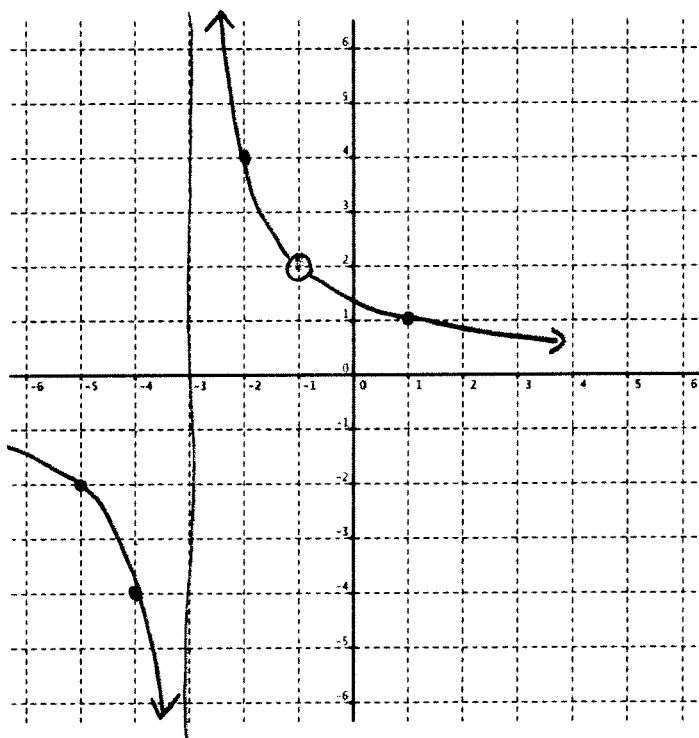
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A

4. Simplify the following rational function. State all restrictions and graph the function.

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

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

$$= \frac{4}{x+3}, \quad x \neq -1, -3$$



/8
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5. Simplify the following rational expressions.

a) $\frac{12x+24}{x^2+3x-10} + \frac{4}{x+5}$

$$= \frac{3 \cancel{12}(x+2)}{(x+5)\cancel{(x-2)}} \times \frac{\cancel{(x+5)}}{4}$$

$$= \frac{3(x+2)}{x-2} \checkmark$$

b) $\frac{3}{x+5} - \frac{2}{x+4}$

$$= \frac{3(x+4)}{(x+5)(x+4)} - \frac{2(x+5)}{(x+4)(x+5)} \checkmark$$

$$= \frac{3(x+4) - 2(x+5)}{(x+5)(x+4)} \checkmark$$

$$= \frac{3x+12-2x-10}{(x+5)(x+4)} \checkmark$$

$$= \frac{x+2}{(x+5)(x+4)} \checkmark$$

/2
K

6. Simplify the following radical expressions.

a) $2\sqrt{25} + 3$

$$= 2(5) + 3$$

$$= 13$$

b) $\sqrt{60}$

$$= \sqrt{4} \sqrt{15}$$

$$= 2\sqrt{15}$$

/4
K

7. Expand and simplify the following radical expression: $(5 + \sqrt{3})(4 - \sqrt{12})$

$$= 20 - 5\sqrt{12} + 4\sqrt{3} - \sqrt{3}\sqrt{12}$$

$$= 20 - 10\sqrt{3} + 4\sqrt{3} - \sqrt{36}$$

$$= 20 - 6\sqrt{3} - 6$$

$$= 14 - 6\sqrt{3}$$

/2
C

8. Describe or correct the error in each of the following statements.

a) $5\sqrt{3} \neq \sqrt{15}$

$$\sqrt{15} = \sqrt{5}\sqrt{3}$$

can't simply
drop $\sqrt{\quad}$ off
of 5.

b) $\frac{x^2 + x - 12}{x^2 + 5x + 6} \neq \frac{x - 12}{5x + 6}$

Can't cancel
~~the~~ without
factoring first!