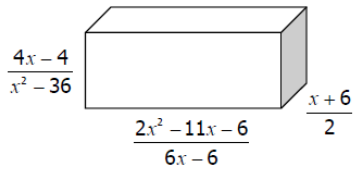


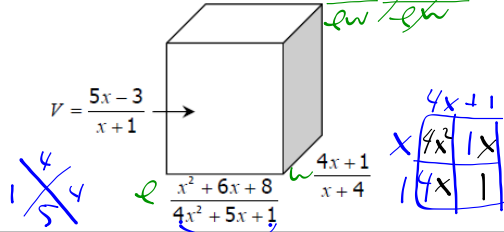
RATIONAL EXPRESSION Applications	
Example	Work and Solution
<p>1. Find an expression to represent the area of the rectangle.</p> <p style="color: red;">$A = \ell \cdot w$</p> <div style="display: flex; align-items: center; justify-content: center;"> <div style="margin-left: 20px;"> $\frac{5x}{x+10} \cdot w$ $\frac{x^2+7x-30}{15x^2} = \ell$ </div> </div>	$\frac{5x}{x+10} \cdot \frac{(x^2+7x-30)}{15x^2}$ $\frac{\cancel{5x} \cdot (x+10)(x-3)}{\cancel{15}x^2} = \frac{x-3}{3x}$ <p style="color: red; font-size: 2em; margin-left: 100px;">30 10 7</p>
<p>2. Find an expression to represent the area of the rectangle.</p> <div style="display: flex; align-items: center; justify-content: center;"> <div style="margin-left: 20px;"> $\frac{x^2-4}{x^2-36}$ $\frac{x^2-6x}{2x+4}$ </div> </div>	
<p>3. If the area of a rectangular garden is $x^2 - 36 = A$ and the length is $x^2 - 2x - 24$, find an expression to represent the width of the garden.</p> <p style="color: red;">$A = \ell \cdot w$</p>	$\frac{(x^2-36)}{x^2-2x-24} = \frac{(x-6)(x+6)}{(x-4)(x+4)}$ <p style="color: red; font-size: 2em; margin-left: 100px;">24 4 -2</p> <p style="color: blue; font-size: 2em; margin-left: 100px;">6 -6 +6 = w</p>

<p>4. If the area of a rectangular garden is $6x^2 - 13x - 5$, and the width is $2x - 5$, find an expression to represent the length of the rectangle.</p>	
<p>5. Find an expression to represent the volume of the rectangular prism shown below.</p> <p style="color: blue;">$V = \ell \cdot w \cdot h$</p> <div style="display: flex; align-items: center; justify-content: center;"> <div style="margin-right: 20px;"> $\frac{2x^2+2x-24}{4x^2+x}$ </div> <div style="margin-left: 20px;"> $\frac{x^2+x-6}{x+4}$ $\frac{8x^2+2x}{x^2-9}$ </div> </div>	$\frac{(2x^2+2x-24)}{4x^2+x} \cdot \frac{x^2+x-6}{x+4} \cdot \frac{(8x^2+2x)}{(x^2-9)}$ <p style="color: red; font-size: 2em; margin-left: 100px;">24 4 -2</p> <p style="color: green; font-size: 2em; margin-left: 100px;">12 4 -3</p> <p style="color: red; font-size: 2em; margin-left: 100px;">6 -6 +3 -3</p> <p style="color: blue; font-size: 2em; margin-left: 100px;">2x(x+4)(x-3) (x+3)(x-3) (x+3)(x-3)</p> <p style="color: green; font-size: 2em; margin-left: 100px;">4(x-2)</p>

6. Find an expression to represent the **volume** of the rectangular prism shown below.



7. Find the **height** of the prism below using the given volume and dimensions. $V = \ell \cdot w \cdot h$

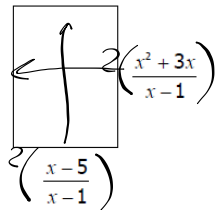


$$\frac{5x-3}{x+1} \cdot \frac{(x^2+6x+8)}{(4x^2+5x+1)} \cdot \frac{4x+1}{x+4}$$

$$\frac{5x-3}{x+1} \cdot \frac{(x+2)(x+4)}{(4x+1)(x+1)} \cdot \frac{4x+1}{x+4}$$

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

8. Find an expression to represent the **perimeter** of the rectangle.

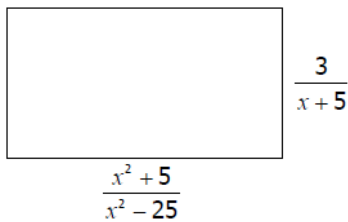


$$2\left(\frac{x^2+3x}{x-1}\right) + 2\left(\frac{x-5}{x-1}\right)$$

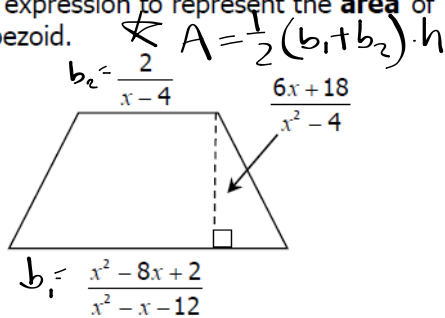
$$\frac{2x^2+6x}{x-1} + \frac{2x-10}{x-1}$$

$$\frac{(2x^2+8x-10) - 2(x^2+4x-5)}{x-1} = \frac{2(x+5)(x-1)}{x-1}$$

9. Find an expression to represent the **perimeter** of the rectangle.

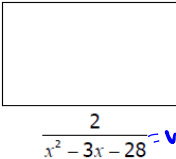
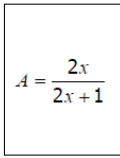


10. Find an expression to represent the **area** of the trapezoid.



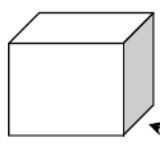
Date: _____ Per: _____ Homework 7: Rational Expressions Applications

** This is a ~~2~~ ³ page document! **

Example	Work and Solution
<p>1. Find an expression to represent the area of the rectangle below.</p> <div style="display: flex; align-items: center; justify-content: center;">  <div style="margin-left: 20px;"> $A = l \cdot w$ $\frac{x^2 - 16}{6x - 24} = l$ $\frac{2}{x^2 - 3x - 28} = w$ </div> </div>	<div style="display: flex; align-items: center;"> $\frac{x^2 - 16}{6x - 24} \cdot \frac{2}{x^2 - 3x - 28}$... you got this! </div>
<p>2. Find an expression to represent the width of the rectangle below using the given dimensions.</p> <div style="display: flex; align-items: center; justify-content: center;">  <div style="margin-left: 20px;"> $A = \frac{l \cdot w}{l}$ $A = \frac{2x}{2x + 1}$ </div> </div>	$\frac{2x}{2x + 1} \div \frac{8x^2 - 8x}{2x^2 - 5x - 3} \dots$
<p>3. If the area of a rectangular garden is $5x^2 + 18x - 8$, and the width is $x + 4$, find an expression to represent the length of the rectangle.</p> <div style="display: flex; align-items: center; justify-content: center;"> $\frac{A = l \cdot w}{w} = \frac{l \cdot w}{w}$ </div>	$\frac{5x^2 + 18x - 8}{x + 4} \dots$

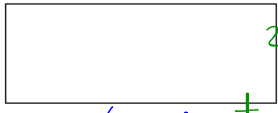
4. Find an expression to represent the **volume** of the rectangular prism shown below.

$h \cdot \frac{x^2 - 5x - 36}{x^2 - 2x}$



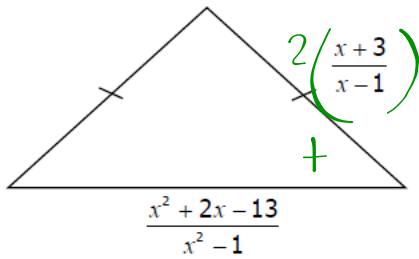
$V = l \cdot w \cdot h$
 $\frac{x^2 + 7x - 18}{x + 4} = l$
 $\frac{x - 1}{x^2 - 81} = w$

5. Find an expression to represent the **perimeter** of the rectangle below.

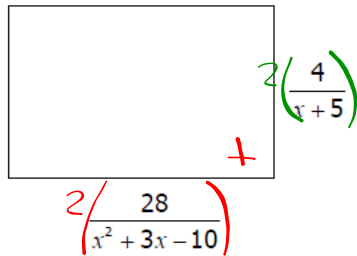


$2 \left(\frac{x^2 - 5x}{x - 2} \right) + 2 \left(\frac{6}{x - 2} \right)$

6. Find the **perimeter** of the isosceles triangle below.



7. Find an expression to represent the **perimeter** of the rectangle below.

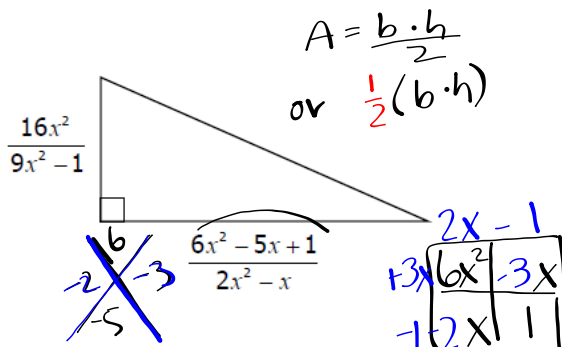


$$2\left(\frac{4}{x+5}\right) + 2\left(\frac{28}{x^2+3x-10}\right)$$

$$\frac{x-2}{x+5} + \frac{56}{(x+5)(x-2)}$$

$$\frac{8x-16}{(x-2)(x+5)} + \frac{56}{(x-2)(x+5)} = \frac{8x+40}{(x-2)(x+5)}$$

8. Find an expression to represent the **area** of the triangle below.

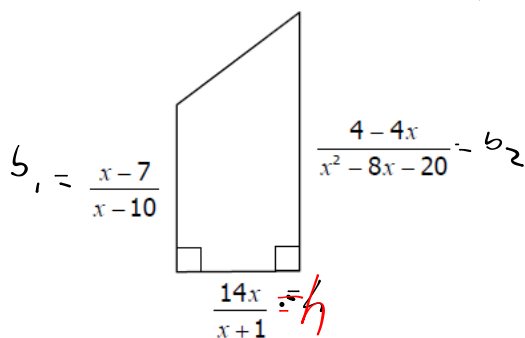


$$\frac{1}{2} \cdot \left(\frac{6x^2-5x+1}{2x^2-x}\right) \cdot \frac{16x^2}{9x^2-1}$$

$$\frac{1}{2} \cdot \frac{(2x-1)(3x-1)}{x(2x-1)} \cdot \frac{16x^2}{(3x+1)(3x-1)}$$

$$\frac{8x}{3x+1}$$

9. Find an expression to represent the **area** of the trapezoid below. $A = \frac{1}{2}(b_1 + b_2) \cdot h$



$$\frac{1}{2} \left(\frac{x-7}{x-10} + \frac{4-4x}{x^2-8x-20} \right) \cdot \frac{14x}{x+1}$$

$$\frac{1}{2} \left(\frac{x^2-5x-14}{(x+2)(x-10)} + \frac{4-4x}{(x+2)(x-10)} \right) \cdot \frac{14x}{x+1}$$

$$\frac{1}{2} \left(\frac{x^2-9x-10}{(x+2)(x-10)} \right) \cdot \frac{14x}{x+1} = \frac{7x}{x+2}$$

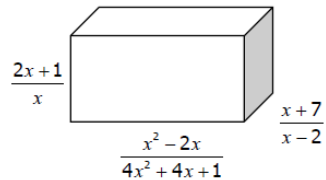
11. $\frac{3z}{z+3} - \frac{2z-30}{4z+12}$

12. $\frac{(x^2+11x-10)}{5x^2+6x-8} - \frac{2}{x+2}$

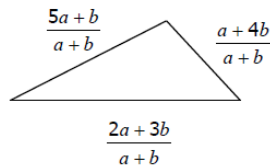
Handwritten notes:
 -40, 6, 10, -4, 5x-4, 10x-8, 2, -10, 11, -10x+8, Don't get common denom first.

Handwritten work:
 $\frac{(x^2+11x-10)}{(5x-4)(x+2)} - \frac{2(5x-4)}{(x+2)(5x-4)}$
 $\frac{(x^2+x-2)}{(5x-4)(x+2)} = \frac{(x+2)(x-1)}{(x+2)(5x-4)}$

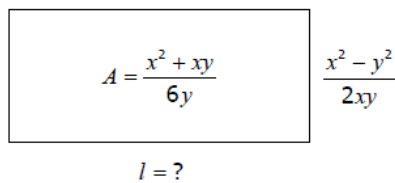
13. Write an expression to represent the **volume** of the rectangular prism in simplest form.



14. Write an expression to represent the **perimeter** of the triangle in simplest form.



15. Write an expression in simplest form for the **length** of the triangle given its area and width.



BONUS: Simplify the expression below completely.

$$\frac{10x+4}{96x^4+24x^2} \div \frac{10x^2-x-2}{48x^5-3x}$$