Math 20-1

KEY

## LO4 – Worksheet - 6.2 Multiplying and Dividing Rational Expressions

**Pg 327 #8abc:** Express each quotient in simplest form. Identify all non-permissible values.

$$\frac{2w^2-w-6}{3w+6} \div \frac{2w+3}{w+2}$$

$w \neq -3/2$

$$\frac{(2w+3)(w-2)}{3(w+2)} \div \frac{(2w+3)}{(w+2)}$$

$w \neq -2$ $\quad w \neq -2$

$$\frac{(2w+3)(w-2)}{3(w+2)} \cdot \frac{(w+2)}{(2w+3)}$$

$$\frac{(w-2)}{3}$$

where $w \neq -2, -3/2$

$$\frac{v-5}{v} \div \frac{v^2-2v-15}{v^3}$$

$v \neq -3$ $\quad v \neq 5$

$$\frac{(v-5)}{v} \div \frac{(v+3)(v-5)}{v^3}$$

$v \neq 0$ $\quad v \neq 0$

$$\frac{(v-5)}{v} \cdot \frac{v^3}{(v+3)(v-5)}$$

$$\frac{v^3}{v(v+3)}$$

$$\frac{v^2}{(v+3)}$$

where $v \neq -3, 0, 5$

$$\frac{9x^2-1}{x+5} \div \frac{3x^2-5x-2}{2-x}$$

$x \neq -1/3$ $\quad x \neq 2$

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

$x \neq -5$ $\quad x \neq 2$

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

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

where $x \neq -5, -1/3, 2$

**Pg 327 #9:** Explain why the non-permissible values in the quotient $\frac{x-5}{x+3} \div \frac{x+1}{x-2}$ are -3, -1, 2.

Can't divide by zero, so numerator can't be zero. $x \neq -1$.

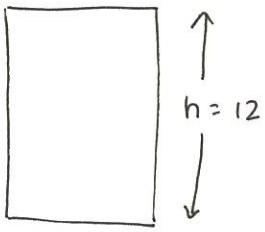
This numbers can't be undefined. $x \neq -3$

This number can't be undefined. $x \neq 2$

Math 20-1 KEY

**Pg 327 #10:** The height of a stack of plywood is represented by $\frac{n^2-4}{n+1}$. If the number of sheets is defined by $n-2$, what expression could be used to represent the thickness of one sheet? Express your answer in simplest form.

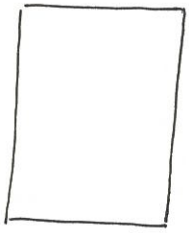
EASY EXAMPLE




If there are 6 sheets, what is the thickness of each sheet?

Thickness = $12 \div 6$

OUR EXAMPLE




There are $n-2$ sheets

Thickness = $\frac{n^2-4}{n+1} \div n-2$

$n \neq 2$

$\frac{(n+2)(n-2)}{(n+1)} \div \frac{(n-2)}{1}$

$n \neq -1$

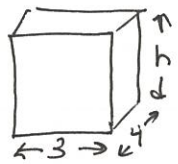
$\frac{(n+2)(n-2)}{(n+1)} \cdot \frac{1}{(n-2)}$

Thickness = $\frac{(n+2)}{(n+1)}$

where $n \neq -1, 2$

**Pg 328 #11c:** Simione is shipping his carving to a buyer in Winnipeg. He makes a rectangular box with a length of $(2x-3)$ meters and width of $(x+1)$ meters. The volume of the box is $(x^2+2x+1)$ cubic meters. What is an expression for the height of the box?

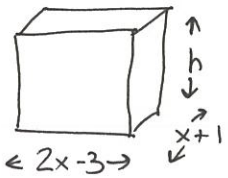
EASY EXAMPLE




VOL = 24

$h = \frac{VOL}{(4)(3)}$

OUR EXAMPLE




VOL = $(x^2+2x+1)$

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

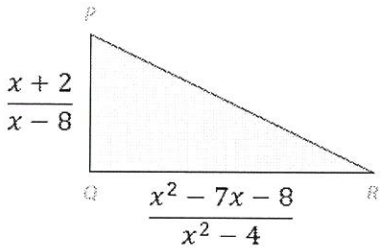
$= \frac{(x+1)(x+1)}{(2x-3)(x+1)}$ $x \neq -1, -1$ $x \neq -1, 3/2$

$= \frac{(x+1)}{(2x-3)}$ where $x \neq -1, 3/2$

KEY

Math 20-1

**Pg 328 #16:** What is an expression for the area of ΔPQR? Give your answer in simplest form.




Area $= \frac{1}{2}(b)(h)$

$= \frac{1}{2} \cdot \frac{(x+2)}{(x-8)} \cdot \frac{(x^2-7x-8)}{(x^2-4)}$

$= \frac{1}{2} \cdot \frac{\cancel{(x+2)}}{\cancel{(x-8)}} \cdot \frac{\cancel{(x-8)}(x+1)}{\cancel{(x+2)}(x-2)}$

$x \neq 8$ $\quad x \neq -2$ $\quad x \neq 2$

$= \frac{(x+1)}{2(x-2)}$ where $x \neq -2, 2, 8$

**Pg 329 #18:** The volume, *V*, of a gas increases or decreases with its temperature, *T*, according to Charles' law by the formula $\frac{V_1}{V_2} = \frac{T_1}{T_2}$. Determine $V_1$ if $V_2 = \frac{n^2-16}{n-1}$, $T_1 = \frac{n-1}{3}$, and $T_2 = \frac{n+4}{6}$. Express your answer in simplest form.

$\frac{V_1}{V_2} = \frac{T_1}{T_2} \Rightarrow V_1 = \frac{T_1 V_2}{T_2} \Rightarrow V_1 = T_1 \cdot V_2 \div T_2$

$V_1 = \frac{(n-1)}{3} \cdot \frac{(n^2-16)}{(n-1)} \div \frac{(n+4)}{6}$

$V_1 = \frac{(n-1)}{3} \cdot \frac{(n+4)(n-4)}{(n-1)} \div \frac{(n+4)}{6}$ $\quad n \neq -4$

$n \neq 1$

$V_1 = \frac{\cancel{(n-1)}}{3} \cdot \frac{\cancel{(n+4)}(n-4)}{\cancel{(n-1)}} \cdot \frac{6}{\cancel{(n+4)}}$

$V_1 = 2(n-4)$ where $n \neq -4, 1$