Review of Prerequisite Skills

1) Slope and Equations of Lines

eg. Find the equation of the line through the points $(-2,7)$ and $(8,-5)$

Find slope:

$$m = \frac{y_2 - y_1}{x_2 - x_1}$$

$$= \frac{7+5}{-2-8}$$

$$= \frac{12}{-10} = \frac{6}{-5}$$

Equation:

$$m = \frac{y - y_1}{x - x_1}$$

$$\frac{6}{-5} = \frac{y-7}{x+2}$$ (sub. in either point)

$$6x + 12 = -5y + 35$$

$$6x + 5y - 23 = 0$$

2) Function Notation

eg. Given $f(x) = \begin{cases} y = \sqrt{x+2}, & \text{if } x \geq -2 \\ y = -\frac{1}{2}x - 1, & \text{if } x < -2 \end{cases}$

Evaluate:

(a) $f(-10) = -\frac{1}{2}(-10) - 1$

$= 5 - 1$

$= 4$

(b) $f(7) = \sqrt{7+2}$

$= \sqrt{9}$

$= 3$

3) Domain of a Function

eg. State the domain of the following:

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

$D = \{x \in R\}$

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

$D = \{x \in R \mid x \neq -4, 1\}$

(c) $y = \sqrt{x-5}$

$D = \{x \in R \mid x \geq 5\}$

4) Rationalizing the numerator / denominator.

eg. Rationalize the denominator.

(a) $\frac{10}{\sqrt{7}} \times \frac{\sqrt{7}}{\sqrt{7}} = \frac{10\sqrt{7}}{7}$

(b) $\frac{6\sqrt{2}}{5+\sqrt{6}} \times \frac{5-\sqrt{6}}{5-\sqrt{6}}$ (multiply by the conjugate)

$= \frac{30\sqrt{2} - 6\sqrt{12}}{25 - 6}$ $\quad \sqrt{12} = 2\sqrt{3}$

$= \frac{30\sqrt{2} - 12\sqrt{3}}{19}$

eg. Rationalize the numerator

$\frac{2\sqrt{3} - 7}{7\sqrt{5}} \times \frac{2\sqrt{3} + 7}{2\sqrt{3} + 7}$ (multiply by the conjugate)

$= \frac{4(3) - 49}{14\sqrt{15} + 49\sqrt{5}}$

$= \frac{12 - 49}{14\sqrt{15} + 49\sqrt{5}} = \frac{-37}{14\sqrt{15} + 49\sqrt{5}}$

HW: pg 72 # 1 (odds), 2 (odds), 4-7, 9