

4

SEMESTER REVIEW

$N = \text{Natural } 1, 2, 3, \dots$

$W = \text{Whole } 0, 1, 2, 3, \dots$

$Z = \text{Integers } \dots -3, -2, -1, 0, 1, 2, 3, \dots$

$Q = \text{Rational} - \frac{m}{n}$ OR $\left. \begin{array}{l} \text{terminating} \\ \text{or repeating} \end{array} \right\} \text{decimals}$

$I = \text{Irrational} - \left. \begin{array}{l} \text{non-terminating} \\ \text{non-repeating} \end{array} \right\} \text{decimals}$ $\pi, \sqrt{2}, \sqrt{17}, e$

$R = \text{Real} - \text{All rational + irrational numbers}$

$i = \text{Imaginary} = \sqrt{-\#}$

$C = \text{Complex} - \underset{\substack{\uparrow \\ \text{real}}}{3} + \underset{\substack{\uparrow \\ \text{imag.}}}{7}i, 4 + 10i, 0 - 9i$

Sig. Digits $\underline{5090}_3, 0.00\underline{87}_2, 0.0000\underline{60}_2 \text{ cm}$

Converting Units $820 \frac{\text{cm}}{\text{sec}}$ Change to m/min .

$$820 \frac{\text{cm}}{\text{sec}} \times \frac{1 \text{ m}}{100 \text{ cm}} \times \frac{60 \text{ sec}}{1 \text{ min}} = \frac{820 \cdot 60}{100} = 492 \frac{\text{m}}{\text{min}}$$

1 ft = 12 in.
3 ft = 1 yd.
5280 ft = 1 mi

$$7 \quad f(x) = \frac{3x+6}{2x-5} \quad f(4) = \frac{3(4)+6}{2(4)-5} = \frac{18}{3} = 6$$

$$8/12 \quad \left[\frac{2}{3}x - 5 = \frac{3}{4}(2x-1) \right] \quad \text{Solve for } x.$$

$$8x - 60 = 9(2x-1)$$

$$\begin{array}{r} 8x - 60 = 18x - 9 \\ -8x \quad +9 \quad -8x \end{array}$$

$$-51 = \frac{10x}{10}$$

$$-\frac{51}{10} = x$$

Matrices

+/- = must be same dimension,

multiplication = 4×3 \times 3×2
 must be same # of row \times # of cols.

$$\begin{bmatrix} -2 & 3 \\ 5 & 6 \\ 0 & -1 \end{bmatrix}_{3 \times 2} \cdot \begin{bmatrix} 2 & -5 \\ 4 & 8 \end{bmatrix}_{2 \times 2} = \begin{bmatrix} -4+12 & 10+24 \\ 10+24 & -25+48 \\ 0+4 & 0-8 \end{bmatrix} = \begin{bmatrix} 8 & 34 \\ 34 & 23 \\ -4 & -8 \end{bmatrix}$$

LINES

Slope-intercept

$$y = mx + b$$

point-slope

$$y - y_1 = m(x - x_1)$$

Standard form

$$Ax + By = C$$

$$m = -\frac{A}{B}$$

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

Horizontal

$$y = \# \quad m = 0$$

Vertical

$$x = \# \quad m = \text{undefined}$$

$$5x - 3y = 15$$

Slope? $-\frac{A}{B} = \frac{+5}{+3}$

x- + y- intercepts

x	y
9	0
0	-15

x-int (9, 0)

y-int (0, -15)

negative reciprocal

Write the eq. of the line perpendicular to $y = -\frac{2}{7}x + 3$ and passing through $(-1, 1)$

$$m = -\frac{2}{7} \quad \perp m = \frac{7}{2}$$

$$y - y_1 = m(x - x_1)$$

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

$$y - 1 = \frac{7}{2}x + \frac{7}{2}$$

$$y = \frac{7}{2}x + \frac{15}{2}$$

14(a) Solve like its an = sign.

★ 14(b)

$$\frac{5+2x}{(x-3)(x+7)} \leq 0$$

$$\leq 0$$

← Negative Solutions

$$\begin{aligned} 5+2x &= 0 \\ 2x &= \frac{-5}{2} \end{aligned}$$

Testing Points!



$$x < -7 \text{ OR } -\frac{5}{2} \leq x < 3$$

$$-5 - 2|x+9| > 1$$

$$\frac{-2|x+9| > -4}{-2}$$

$$|x+9| < 2$$

$$\begin{aligned} x+9 &< 2 \\ -9 \quad -9 \\ x &< -7 \end{aligned}$$

AND

$$\begin{aligned} x+9 &> -2 \\ -9 \quad -9 \\ x &> -11 \end{aligned}$$

change both!

- 1) Isolate the abs value.
- 2) Write + solve 2 equations
- 3) Graph on # line

Greater OR Less than AND
 anything shaded
 must overlap

