10-31-17 1st Trig

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

(8) $(2,-1)(3,-9)$

$m = \frac{\Delta y}{\Delta x} = \frac{-9+1}{3-2} \quad \frac{-8}{1} = -8$

$y - {}^-1 = -8(x-2)$

$y + 1 = -8x + 16$

$\quad -1 \qquad\qquad -1$

$y = -8x + 15$

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

through $(2,8)$ and is

$\perp$ to $2x + y = 10$

$-2x \qquad -2x$

$y = -2x + 10$

$m = -2$

$\therefore \perp m = \frac{1}{2}$

$y - 8 = \frac{1}{2}(x-2)$

$y - 8 = \frac{1}{2}x - 1$

$+8 \qquad\qquad +8$

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

$-\frac{1}{2}x \quad -\frac{1}{2}x$

If in standard

$-2\left[-\frac{1}{2}x + y = 7\right]$

$x - 2y = -14$

Give eq. in SIF that goes through (-4,10) and is parallel to $3x+y=5$.

$$\begin{aligned} 3x + y &= 5 \\ -3x \quad & \quad -3x \\ \hline y &= -3x+5 \end{aligned}$$

$m = -3$

$y - 10 = -3(x+4)$

$y - 10 = -3x - 12$

$+10 \qquad +10$

$y = -3x - 2$

Ex 2: Change to Standard form

$$y = \frac{3}{4}x + 7$$

$-\frac{3}{4}x \quad -\frac{3}{4}x$

$-4\left[-\frac{3}{4}x + y = 7\right]$

$3x - 4y = -28$ $\quad -\frac{4}{1}\cdot -\frac{3}{4} = \frac{12}{4} = 3$

22 $\dfrac{24!}{22!\ 4!} = \dfrac{24\cdot 23\cdot \cancel{22\cdot 21\cdots 2\cdot 1}}{\cancel{22\cdot 21\cdots 2\cdot 1}\ \boxed{4\cdot 3\cdot 2\cdot 1}}$ $= 24$

$\dfrac{\cancel{24}\cdot 23}{\cancel{24}}$

23

Ex 3: $(2,1)(4,-11)$

$$\text{slope} = \frac{\Delta y}{\Delta x} = \frac{1 - -11}{2-4} = \frac{12}{-2} = -6$$

$$\text{midpoint} = \left(\frac{2+4}{2}, \frac{1+-11}{2}\right) = (3,-5)$$

$$\text{distance} = \sqrt{\Delta x^2 + \Delta y^2}$$
$$\sqrt{2^2 + 12^2}$$
$$\sqrt{4+144}$$
$$\sqrt{148}$$
$$\approx 12.2$$

Ex 3: Give the midpoint of $(n,8)(n+10,6)$

$$\left(\frac{n+n+10}{2}, \frac{8+6}{2}\right)$$

$$\frac{2n+10}{2}, 7$$

$$(n+5, 7)$$

Ex 3: Put in slope intercept form

$$3x - 2y = 10$$
$$-3x \qquad -3x$$
$$\frac{-2y}{-2} = \frac{-3x}{-2} + \frac{10}{-2}$$
$$y = \frac{3}{2}x - 5$$

10-31-17 3rd Trig

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

(10) $(2,8)$

$\perp$ to $2x + y = 10$

Not in slope int. form

$2x + y = 10$
$-2x \qquad -2x$

$y = -2x + 10$

$m = -2$

$\therefore \perp m = \frac{1}{2}$

$y - 8 = \frac{1}{2}(x - 2)$

$y - 8 = \frac{1}{2}x - 1$
$+8 \qquad\qquad +8$

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

(14) $30\left[\frac{2}{5}y + \frac{2}{3}x = \frac{1}{2}\right]$

$12y + 20x = 15$

$20x + 12y = 15$

5
10
15
20
25
30
35
40
45

$\frac{30}{1} \cdot \frac{2}{5} = \frac{60}{5}$

$\frac{30}{1} \cdot \frac{2}{3} = \frac{60}{3}$

$\frac{30}{1} \cdot \frac{1}{2} = \frac{30}{2}$

Ex 1: Give midpoint of line that has endpoints of

$(n, 6)\ (n+8, 10)$

$$\left(\frac{n+n+8}{2}, \frac{6+10}{2}\right)$$

$$\left(\frac{2n+8}{2}, \frac{16}{2}\right)$$

$$(n+4, 8)$$

22 $\quad \dfrac{24!}{22!\ 4!} = \dfrac{24\cdot 23\cdot \cancel{\ldots \cdot 2\cdot 1}}{\cancel{22\cdot 21\cdot \ldots \cdot 2\cdot 1}\ \ 4\cdot 3\cdot 2\cdot 1}$

$$\frac{552}{24} \leftarrow \frac{24\cdot 23}{4\cdot 3\cdot 2\cdot 1}$$

$$\frac{\cancel{24}\cdot 23}{\cancel{24}} = 23$$

Ex 2: $\dfrac{40!}{39!\cdot 3!} \quad \dfrac{40\cdot \cancel{39\cdot \ldots \cdot 2\cdot 1}}{\cancel{39\cdot 38\cdot \ldots \cdot 2\cdot 1}\ \ 3\cdot 2\cdot 1}$

$$\frac{40}{6} = 6.\overline{6}$$

Ex 3: $(-2,1)(-4,7)$

$$\text{slope} = \frac{\Delta y}{\Delta x} = \frac{7-1}{-4+2} = \frac{6}{-2} = -3$$

$$\text{midpoint} = \left(\frac{-2+-4}{2}, \frac{1+7}{2}\right) = (-3,4)$$

distance $\sqrt{\Delta x^2 + \Delta y^2}$

$$\sqrt{2^2+6^2}$$

$$\sqrt{4+36}$$

$$\sqrt{40}$$

$$\approx 6.3$$

Ex 4: Put $3x-5y=15$ in slope intercept form

$$\begin{array}{rcl} 3x-5y &=& 15 \\ -3x & & -3x \\ \hline \frac{-5y}{-5} &=& \frac{-3x}{-5} + \frac{15}{-5} \end{array}$$

$$y = \frac{3}{5}x - 3$$

Ex 4: Give eq. in SIF that goes through $(2,4)$ and $(4,14)$.
$x_1\ y_1$

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

$$m = \frac{\Delta y}{\Delta x} = \frac{14-4}{4-2} = \frac{10}{2} = 5$$

$$y-4 = 5(x-2)$$

$$\begin{array}{rcl} y-4 &=& 5x-10 \\ +4 & & +4 \\ \hline y &=& 5x-6 \end{array}$$

Ex 6: $\dfrac{40!\ 22!}{39!\ 21!}$

$$\frac{40\cdot\cancel{39}\cdot\cancel{\ldots}\cdot\cancel{2}\cdot\cancel{1}}{\cancel{39}\cdot\cancel{\ldots}\cdot\cancel{2}\cdot\cancel{1}}\ \frac{22\cdot\cancel{21}\cdot\cancel{\ldots}\cdot\cancel{2}\cdot\cancel{1}}{\cancel{21}\cdot\cancel{20}\cdot\cancel{\ldots}\cdot\cancel{2}\cdot\cancel{1}}$$

$$\frac{40\cdot 22}{1} = 880$$

10-31-17 4th Trig

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

(10) $(2, 8)$

$\perp$ to $2x + y = 10$

$$\begin{array}{r} 2x + y = 10 \\ -2x \qquad -2x \\ \hline y = -2x + 10 \end{array}$$

$m = -2 \therefore \perp m = \frac{1}{2}$

$$y - 8 = \frac{1}{2}(x - 2)$$

$$\begin{array}{r} y - 8 = \frac{1}{2}x - 1 \\ +8 \qquad +8 \\ \hline y = \frac{1}{2}x + 7 \end{array}$$

(22) $$\frac{24!}{22!\ 4!} = \frac{24 \cdot 23 \cdot \cancel{22 \cdot 21 \cdots 2 \cdot 1}}{\cancel{22 \cdot 21 \cdots 2 \cdot 1}\ 4 \cdot 3 \cdot 2 \cdot 1}$$

$$\frac{552}{24} \leftarrow \frac{24 \cdot 23}{4 \cdot 3 \cdot 2 \cdot 1}$$

$$23 \qquad \frac{\cancel{24} \cdot 23}{\cancel{24}}$$

Ex 1: $$\frac{31!}{29!\ 3!} \qquad \frac{31 \cdot 30 \cdot \cancel{29 \cdot 28 \cdots 2 \cdot 1}}{\cancel{29 \cdot 28 \cdots 2 \cdot 1}\ 3 \cdot 2 \cdot 1}$$

$$\frac{31 \cdot 30}{3 \cdot 2 \cdot 1} = 155$$

Ex 2: Give the eq. in SIF that goes through $(1,4)$ and $(\underline{2}, \underline{10})$.

$$m = \frac{\Delta y}{\Delta x} = \frac{10-4}{2-1} = \frac{6}{1} = 6$$

$$y - y_1 = m(x - x_1)$$
$$y - 4 = 6(x-1)$$
$$y - 4 = 6x - 6$$
$$\underline{\quad +4 \qquad\quad +4}$$
$$y = 6x - 2$$

Ex 3: Put in Standard form

$$12\left[\frac{2}{3}x + \frac{1}{4}y = 2\right]$$

$$8x + 3y = 24 \qquad \frac{12}{1}\cdot\frac{2}{3} = \frac{24}{3} = 8$$
$$\frac{12}{1}\cdot\frac{1}{4} = \frac{12}{4} = 3$$

Ex 4: $(-2,7)(1,13)$

$$\text{slope} = \frac{\Delta y}{\Delta x} = \frac{13-7}{1\cancel{-}+2} = \frac{6}{3} = 2$$

$$\text{midpoint} = \left(\frac{-2+1}{2}, \frac{7+13}{2}\right) = \left(-\frac{1}{2}, 10\right)$$

$$\text{distance} = \sqrt{\Delta x^2 + \Delta y^2}$$
$$\sqrt{3^2 + 6^2}$$
$$\sqrt{9+36}$$
$$\sqrt{45}$$
$$\approx 6.7$$

Ex 5: $\displaystyle\sum_{n=-8}^{-6} 2n+10$

$n=-8 \quad 2(-8)+10 = -6$

$n=-7 \quad 2(-7)+10 = -4$

$n=-6 \quad 2(-6)+10 = -2$

-12

Ex 6: Give eq. in SIF that goes through $(-4,-6)$ and is $\perp$ to $y=2x-1$

$y - -6 = -\frac{1}{2}(x+4)$ $\quad m=2$

$\therefore \perp m = -\frac{1}{2}$

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

$\quad -6 \qquad\qquad -6$

$y = -\frac{1}{2}x - 8$

Ex 7: Change to standard form.

$$y = \frac{2}{3}x - \frac{1}{10}$$

$$-\frac{2}{3}x \quad -\frac{2}{3}x$$

$$-30\left[-\frac{2}{3}x + y = -\frac{1}{10}\right]$$

$$20x - 30y = 3$$

$$-\frac{30}{1} \cdot -\frac{2}{3} = \frac{60}{3}$$

Ex 8: Give midpoint of

$$(n+6, 10)\ (n, 4)$$

$$\left(\frac{n+6+n}{2}, \frac{10+4}{2}\right)$$

$$\left(\frac{2n+6}{2}, \frac{14}{2}\right)$$

$$(n+3, 7)$$