Analytic Geometry CP
Review 3.1 – 3.2

Name _____

1. Write the equation of the line if $m = -\frac{2}{5}$ and $b = 4$ in GENERAL FORM.

2. Write the GENERAL FORM of the equation of the line that passes through A with slope m. Use the Point-Slope Formula.

a. $A(-5,3)$, $m = -\frac{2}{3}$

b. $A(3,0)$, $m = -\frac{4}{3}$

3. Write the GENERAL FORM of the equation of the line passing through A and B. Use the Two-Point Formula.

a. $A(-5,1)$, $B(6,-2)$

b. $A(-4,-3)$, $B(-4,-9)$

4. Write the GENERAL FORM of the equation of the line with x-intercept a and y-intercept b.

$a = -4$ $b = 11$

5. Find the GENERAL FORM of the equation of **TWO** lines, one parallel and one perpendicular to $2x - 5y = 8$, through point (7, -3).

6. Find the GENERAL FORM of the equation of the perpendicular bisector of the segment joining $R(2,-8)$ and $T(3,7)$.

7. The sides of a triangle are the lines $2x + y - 7 = 0$, $2x - 3y + 13 = 0$, and $2x + 3y - 5 = 0$. Find the vertices.

8. If the line l has slope $\frac{2}{3}$ and contains the point (3, 4), at what points does it cross the coordinate axes?

Analytic CP

3.1 - 3.2 Review

① You are given the slope and the y-intercept, b so use the slope intercept form of an equation. $m = -\frac{2}{5}$, $b = 4$.

$y = mx + b$

$y = -\frac{2}{5}x + 4$ Plug in givens

$5\left(y = -\frac{2}{5}x + 4\right)$ Multiply by 5 to cancel fractions

$5y = -2x + 20$

$\boxed{2x + 5y - 20 = 0}$ Move stuff / simplify

② a) $A = (-5, 3)$ $m = -\frac{2}{3}$

$y - y_1 = m(x - x_1)$ Point-Slope Form

$y - 3 = -\frac{2}{3}(x - (-5))$ Givens

$y - 3 = -\frac{2}{3}(x + 5)$ Simplify / Distribute

$\left(y - 3 = -\frac{2}{3}x - \frac{10}{3}\right)3$ cancel fractions

$3y - 9 = -2x - 10$ Move stuff

$+2x \quad +10 \quad +2x + 10$

$2x + 3y + 1 = 0$ General Form

(2) b) $(A = (3,0) \quad m = -\frac{4}{3}$

$y - y_1 = m(x - x_1)$ Point-Slope Form

$y - 0 = -\frac{4}{3}(x - 3)$ Givens

$\left(y = -\frac{4}{3}x + \frac{12}{3}\right)3$ Cancel fractions

$3y = -4x + 12$ Move Stuff

$\boxed{4x + 3y - 12 = 0}$

(3) a) $A = (-5, 1) \quad B = (6, -2)$

2 POINT FORM $\Rightarrow \frac{y - y_1}{x - x_1} = \frac{y_2 - y_1}{x_2 - x_1}$

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$\frac{y - 1}{x - (-5)} = \frac{-2 - 1}{6 - (-5)}$ Givens

$\frac{y - 1}{x + 5} = \frac{-3}{11}$ simplify

$11(y - 1) = -3(x + 5)$ Cross-Multiply

$11y - 11 = -3x - 15$

$3x + 11y - 11 + 15 = 0$ Move Stuff

$\boxed{3x + 11y + 4 = 0}$ Simplify

(3) $A = (-4, -3)$ $B = (-4, -9)$

$$\frac{y - y_1}{x - x_1} = \frac{y_2 - y_1}{x_2 - x_1}$$

$$\frac{y - (-3)}{x - (-4)} = \frac{-9 - (-3)}{-4 - (-4)}$$

$$\frac{y + 3}{x + 4} = \frac{-6}{0}$$

$$0 = -6(x + 4)$$

$$-6x + 24 = 0$$

$$-6x = 24$$

$$\boxed{x = -4}$$

(4) Use the intercept form of an equation $a = -4$ $b = 11$

$$\frac{x}{a} + \frac{y}{b} = 1$$

Givens

$$\left(\frac{x}{-4} + \frac{y}{11} = 1\right) \cdot -44$$

Multiply by -44 to cancel the negative x and the fractions

$$11x - 4y = -44$$

$$\boxed{11x - 4y + 44 = 0}$$

Simplify

(5) Find two lines — parallel + perpendicular — to $2x - 5y = 8$, thru $(7, -3)$

$2x - 5y = 8$ Standard form

slope: $m = \frac{-A}{B} = \frac{-2}{-5} = \frac{2}{5}$

$\parallel$ slope $m = \frac{2}{5}$

$\perp$ slope $m = -\frac{5}{2}$

} Slopes of two new lines

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

$y - (-3) = \frac{2}{5}(x - 7)$

$\left(y + 3 = \frac{2}{5}x - \frac{14}{5}\right)5$

$5y + 15 = 2x - 14$

$2x - 5y - 14 - 15 = 0$

$\boxed{2x - 5y - 29 = 0}$

} parallel

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

$y - (-3) = -\frac{5}{2}(x - 7)$

$\left(y + 3 = -\frac{5}{2}x + \frac{35}{2}\right)2$

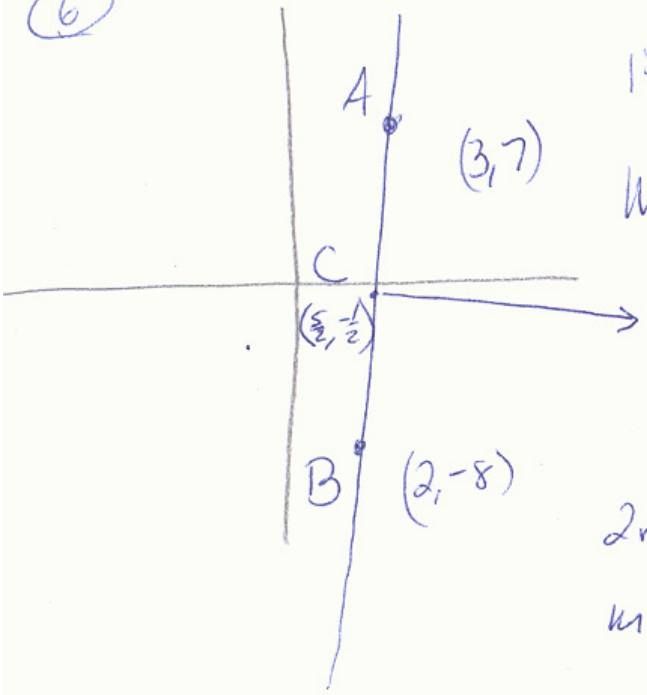
$2y + 6 = -5x + 35$

$5x + 2y + 6 - 35 = 0$

$\boxed{5x + 2y - 29 = 0}$

} $\perp$

(6)



1st, find the midpoint of $\overline{AB}$

$M = (x,y) = \left(\frac{x_1+x_2}{2}, \frac{y_1+y_2}{2}\right)$

$= \left(\frac{3+2}{2}, \frac{7+(-8)}{2}\right)$

$= \left(\frac{5}{2}, -\frac{1}{2}\right)$

2nd: find the slope of $\overline{AB}$

$m = \frac{7-(-8)}{3-2} = \frac{15}{1} = 15$

Point $C = \left(\frac{5}{2}, -\frac{1}{2}\right)$ slope of $\overline{AB} = 15$

So slope of $\perp$ bisector is $-\frac{1}{15}$

$y - \left(-\frac{1}{2}\right) = -\frac{1}{15}\left(x - \frac{5}{2}\right)$

$\left(y + \frac{1}{2} = -\frac{1}{15}x + \frac{5}{30}\right)30$

$30y + 15 = -2x + 5$

$2x + 30y + 15 - 5 = 0$

$\boxed{2x + 30y + 10 = 0}$

(7)

A $2x+y-7=0$ B $2x-3y+13=0$ C $2x+3y-5=0$

A $3(2x+y-7=0)$ $6x+3y-21=0$

B $2x-3y+13=0$ $2x-3y+13=0$

$8x \quad -8=0$

$8x=8$

$x=1$

$2(1)-3y+13=0$

$2-3y+13=0$

$3y=15$

$y=5$

(1, 5)

A $(2x+y-7=0)-3$ $-6x-3y+21=0$

C $2x+3y-5=0$ $2x+3y-5=0$

$-4x \quad +16=0$

$-4x=-16$

$x=4$

$2(4)+3y-5=0$

$8+3y-5=0$

$3y+3=0$

$3y=-3$

$y=-1$

(4, -1)

B $2x-3y+13=0$

C $2x+3y-5=0$

$4x+8=0$

$4x=-8$

$x=-2$

$2(-2)+3y-5=0$

$-4+3y-5=0$

$3y-9=0$

$3y=9$

$y=3$

(-2, 3)

(8) $l_1 : m = \frac{2}{3}$ $P = (3, 4)$

1st find equation of the line.

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

$y - 4 = \frac{2}{3}(x - 3)$

$(y - 4 = \frac{2}{3}x - 2)3$

$3y - 12 = 2x - 6$

$2x - 3y + 12 - 6 = 0$

$2x - 3y + 6 = 0$

When the line crosses the x-axis $y = 0$. When the line crosses the y-axis, $x = 0$.

$2(0) - 3y + 6 = 0$

$-3y + 6 = 0$

$3y = 6$

$y = 2$

$(0, 2)$

$2x - 3(0) + 6 = 0$

$2x + 6 = 0$

$2x = -6$

$x = -3$

$(-3, 0)$