Writing the Equations of Lines

Chapter Review

Using Slope- Intercept Form

Use formula $y = mx + b$, use given information to find m, b.

Example - Find the equation of a line that has a slope of 2 and passes through the point $(3, 9)$

$y = mx + b$

9 ↑ 2 ↑ 3 ↑ solve for b

$9 = 2(3) + b$

$9 = 6 + b$

$b = 3$

equation of line $y = 2x + 3$

Using Point-Slope Form

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

plug in these values – then solve for y
write equation as $y = mx + b$

Example - Find the equation of a line that has a slope of 2 and passes through the point (3,9)

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

$9 \quad 2 \quad 3$

$y - 9 = 2(x - 3)$

$y - 9 = 2x - 6$

$+9 \qquad +9$

$y = 2x + 3$ ← equation of line

Finding Linear Equations Given Two Points

- Can use point-slope formula or $y = mx + b$
- Both methods require you to find the slope, m

Example - Find the equation of a line that passes through (1,2) and (3,-8)

$$m = \frac{2-(-8)}{1-3} = \frac{2+8}{-2} = \frac{10}{-2} = -5$$

$m = -5$

$y = mx + b$, use $m = -5$ and one point on the line, (1,2) or (3,-8)

$m = -5$ point (1,2)

$y = mx + b$
$2 = -5(1) + b$
$2 = -5 + b$
$b = 7$

Equation of line, $y = -5x + 7$

Point-slope formula, use $m=-5$ and one point on the line, $(1,2)$ or $(3,-8)$

$m=-5$ point $(3,-8)$

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

$-8 \quad -5 \quad 3$

$$y-(-8)=-5(x-3)$$

$$y+8=-5x+15$$

$$-8 \qquad -8$$

Equation of line → $y=-5x+7$

Standard Form of Linear Equations

Write equation in $Ax+By=C$ form

No fractions, integers only

Example,

Write $y=-\frac{1}{2}x+5$ in Standard form

$$y=-\tfrac{1}{2}x+5$$

$$+\tfrac{1}{2}x \quad +\tfrac{1}{2}x$$

$$y+\tfrac{1}{2}x=5$$

clear fractions

$$2\left(y+\tfrac{1}{2}x=5\right)$$

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

Best Fitting Lines

Objective- writing an equation of a line that follows the trend of points on the graph

1. Draw a line that "best" fits trend

2. Pick two points on line- find equation