Two lines that are parallel must have the following:
- Same Slope
- Different y-intercept

Two lines that are perpendicular must have the following:
- Slopes must be opposite reciprocals
- The y-intercept is not important (it could be the same
  or different)

Is each pair of lines parallel, perpendicular, or neither?

1. $y = 4x - 7$ Neither $y = \dfrac{1}{4}x + 3$

$m = 4$ $m = \frac{1}{4}$

2. $y = 3x + 1$ Perpendicular $2x + 6y = 24 \rightarrow$ $y = \dfrac{24 - 2x}{6}$

$m = 3$ $m = -\frac{1}{3}$ $y = 4 - \frac{1}{3}x$

3. $y = -2x + 5$ Neither $y = -2$

$m = -2$ $m = 0$ HORIZ

4. $y = 5$ Perpendicular $x = 5$

Horiz   Vert

5. Given the line $y = 3x - 7$

Write the equation of the line that is (parallel) to the line above but passes through the point (-6, 5)

same slope

$m = 3$

point-slope

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

$y - 5 = 3(x + 6)$

slope-int

$y - 5 = 3x + 18$

$y = 3x + 23$

6. Given the line $y = -2x + 5$

Slopes are opposite reciprocals

Write the equation of the line that is (perpendicular) to the given line but passes through the point (-8, 11)

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

$y - 11 = \frac{1}{2}(x + 8)$

or

$y = \frac{1}{2}x + 15$