Take up HW
P105 # 4, 5, 6, 8, 9

(c) \( m = \frac{3}{4} \quad m = \frac{6}{8} \)
Parallel \( \rightarrow \) slopes are the same

(b) \( m = 3 \quad m = -\frac{1}{3} \)
Perpendicular \( \rightarrow \) slopes are negative reciprocals

(c) \( m = 5 \quad m = -5 \)
Neither \( \rightarrow \) slopes are different and not negative reciprocals

(d) \( m = 0.4 \quad m = \frac{2}{5} \)
Parallel \( \rightarrow \) slopes are the same

(e) \( m = 2 \frac{1}{2} \quad m = -\frac{2}{5} \)
Perpendicular \( \rightarrow \) they are negative reciprocals

(f) \( m = \frac{1}{2} \quad m = -\frac{1}{2} \)
Neither \( \rightarrow \) different slopes that are not negative reciprocals

(g) \( m = 0 \quad m = \text{undefined} \)
Perpendicular
\( \rightarrow \) 0 slope means horizontal
undefined slope means vertical
\( x = a \)
\( y = a \)
\(5\) Lines parallel to ..... 

(a) \(y = 3x + 5 \quad \rightarrow \quad y = 3x\) 

(b) \(y = -2x + 3 \quad \rightarrow \quad y = -2x + 1\) 

(c) \(y = \frac{2}{3}x + 4 \quad \rightarrow \quad y = \frac{2}{3}x - 3\) 

(d) \(y = -\frac{2}{3}x - 7 \quad \rightarrow \quad y = -\frac{2}{3}x + 4\) 

**Standard \(\rightarrow\) slope-intercept**

1. Isolate for the \(y\)-term 
2. Divide by coefficient of \(y\)

\(e\) \[2x + 3y = 12\] 
\[3y = \frac{12}{3} - \frac{2x}{3}\] 
\[y = 4 - \frac{2}{3}x\] 
\[y = -\frac{2}{3}x + 4\] 
\[\rightarrow\] \(y = -\frac{2}{3}x + 8\)

\(f\) \[5x - 3y - 15 = 0\] 
\[-3y = -5x + 15\] 
\[y = \frac{5}{3}x - 5\] 
\[\rightarrow\] \(y = \frac{5}{3}x + 4\)

\(h\) \[x = 3 \quad \rightarrow \quad x = 4\] 
\[\text{vertical}\]

\(g\) \[y = -4 \quad \rightarrow \quad y = 5\] 
\[\text{horizontal}\]
6. Perpendicular lines to ...

(a) \( y = 3x + 5 \rightarrow y = -\frac{1}{3}x + 12 \)

(b) \( y = -2x + 3 \rightarrow y = \frac{1}{2}x - 6 \)

(c) \( y = \frac{2}{3}x + 4 \rightarrow y = -\frac{3}{2}x + 7 \)

(d) \( y = -\frac{3}{5}x - 7 \rightarrow y = \frac{5}{2}x + 7 \)

(e) \( y = -\frac{2}{3}x + 4 \rightarrow y = \frac{3}{2}x + 2 \)

(f) \( y = \frac{5}{3}x - 5 \rightarrow y = -\frac{3}{5}x - 4 \)

(g) \( x = 3 \rightarrow y = 4 \)

(h) \( y = -4 \rightarrow x = 4 \)
8. (a) Standard → Slope-intercept

\[3x + 2y - 7 = 0\]
\[
\frac{2y}{2} = -\frac{3x}{2} + \frac{7}{2}
\]
\[y = -\frac{3}{2}x + \frac{7}{2}\]

(b) Identify the slope
\[m = -\frac{3}{2}\]

(c) Slope of a parallel line
Parallel = same slope
\[\Rightarrow m = -\frac{3}{2}\]

(d) Equations of 2 lines parallel to the original
\[y = -\frac{3}{2}x + 10\]
\[y = -\frac{3}{2}x + 17\]
(a) Standard to slope-intercept form

\[ 5x - 2y + 4 = 0 \]

\[ -2y = -5x - 4 \]

\[ y = \frac{5}{2}x + 2 \]

(b) Identify the slope

\[ m = \frac{5}{2} \]

(c) Slope of a perpendicular line

\[ m = -\frac{2}{5} \]

(d) Equation of 2 lines perpendicular to the original

\[ y = -\frac{2}{5}x + 7 \]

\[ y = -\frac{2}{5}x - 911 \]
Homework
P106 # 11 & 12
Equation of a line parallel to it that goes through $(6, 4)$

\[ y = mx + b \]

\[ 4 = 3(6) + b \]
\[ 4 = 18 + b \]
\[ 4 - 18 = b \]
\[ -14 = b \]
11. (a) \( A(1,3) \quad B(5,1) \quad C(6,3) \)

\[
m = \frac{y_2 - y_1}{x_2 - x_1}
\]

\[
m_{AB} = \frac{1 - 3}{5 - 1} = \frac{-2}{4} = -\frac{1}{2}
\]

\[
m_{BC} = \frac{3 - 1}{6 - 5} = \frac{2}{1} = 2
\]

The slopes ARE negative reciprocals so the lines are perpendicular \( \Rightarrow \) It is a right triangle
\[ y = 3x + 2 \]

Equation of a line perpendicular to it that goes through \((9, 3)\):

\[ y = mx + b \]
\[ 3 = \frac{-1}{3} (9) + b \]
\[ 3 = -3 + b \]
\[ 3 + 3 = b \]
\[ y = \frac{1}{3}x + 6 \]
\[ 6 = b \]