Straight Lines Homework 2 Solutions

1) Find the equation of a line parallel to $y = 4x + 3$ which passes through $(2, 1)$

$m_1 = 4$, parallel so $m_2 = 4$

Line of form $y = 4x + c$

Sub $(2, 1)$

$$1 = 4(2) + c$$
$$1 = 8 + c$$
$$1 - 8 = c$$
$$-7 = c$$
$$y = 4x - 7$$

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2) Find the equation of a line perpendicular to $y = \frac{1}{3}x + 2$ which passes through $(5, 19)$

$m_1 = \frac{1}{3}$, perpendicular so $m_2 = -\frac{3}{1}$

$m_2 = -3$

Line of form $y = -3x + c$

Sub $(5, 19)$

$19 = -3(5) + c$

$19 = -15 + c$

$19 + 15 = c$

$34 = c$

$y = -3x + 34$

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3) Find the equation of a line which passes through $(2, 7)$ and $(5, 13)$

$$m_1 = \frac{y_2 - y_1}{x_2 - x_1} = \frac{13 - 7}{5 - 2} = \frac{6}{3} = 2$$

Line of form

$y = 2x + c$

Sub $(2, 7)$

$7 = 2(2) + c$

$7 = 4 + c$

$7 - 4 = c$

$3 = c$

$y = 2x + 3$
