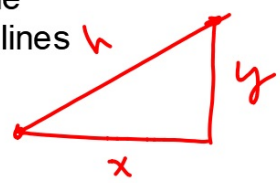
Trig 7.7

*Geom Ch. 3

Find the distance from a point to a line

Find the distance between 2 parallel lines



Quiz 7.5-7.7 Wed.?

$x^2+y^2=h^2$

slope $y = mx+B$

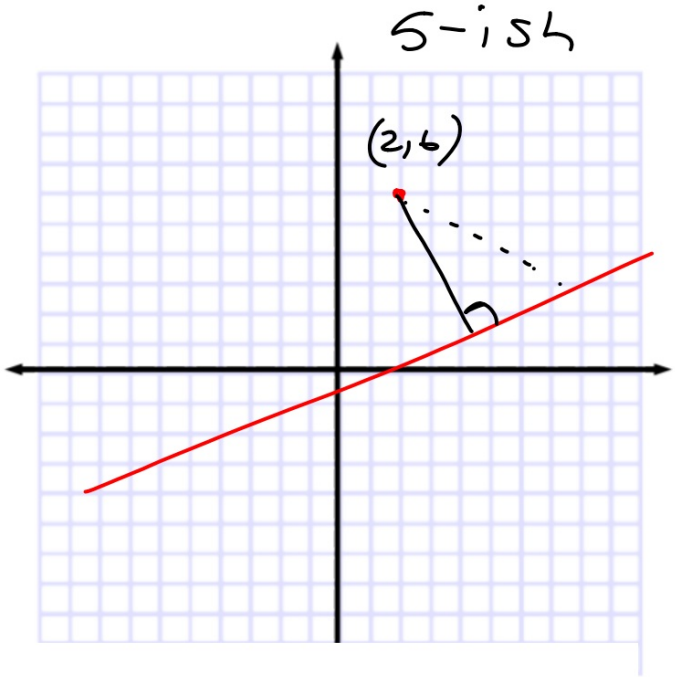
y-intercept

parallel lines $y = mx+B$

distance $y = mx+B$

whiteboards

Where is the (shortest) distance?
Plan: Use the pythagorean theorem
What do I need to know?



1 Find the distance between $P(4, 5)$ and the line with equation $8x + 5y = 20$.

whiteboards 0.5 ish

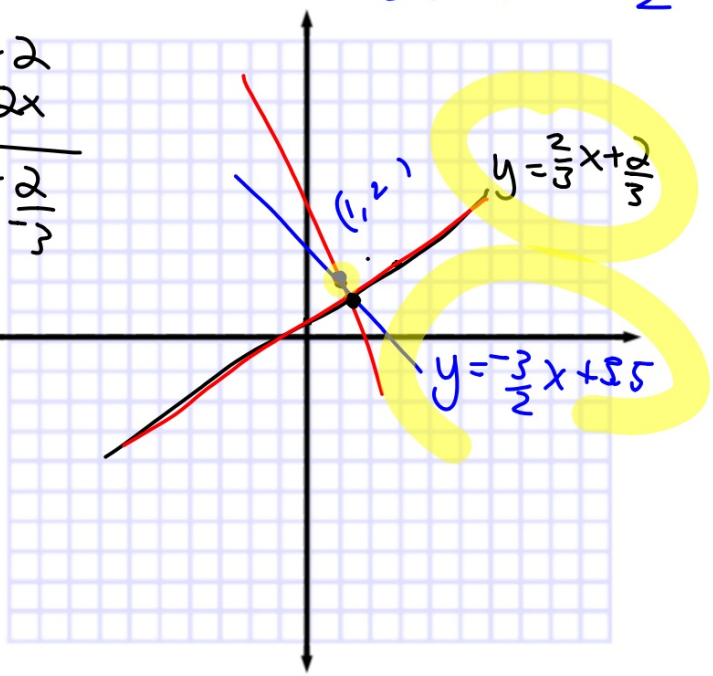
Find the distance between the point with the given coordinates and the line with the given equation.

5. $(1, 2)$, $2x - 3y = -2$

6. $(-2, 3)$, $6x - y = -3$

⊥ line $m = -\frac{1}{2}$

$2x - 3y = -2$
$-2x \quad -2x$
$-3y = -2x - 2$
$\frac{-3y}{-3} = \frac{-2x}{-3} - \frac{2}{-3}$
$y = \frac{2}{3}x + \frac{2}{3}$



$y = mx + b$
$2 = -\frac{3}{2}(1) + b$
$2 = -1.5 + b$
$+1.5 \quad +1.5$
$3.5 = b$

2-ish

$6x - y = -3$

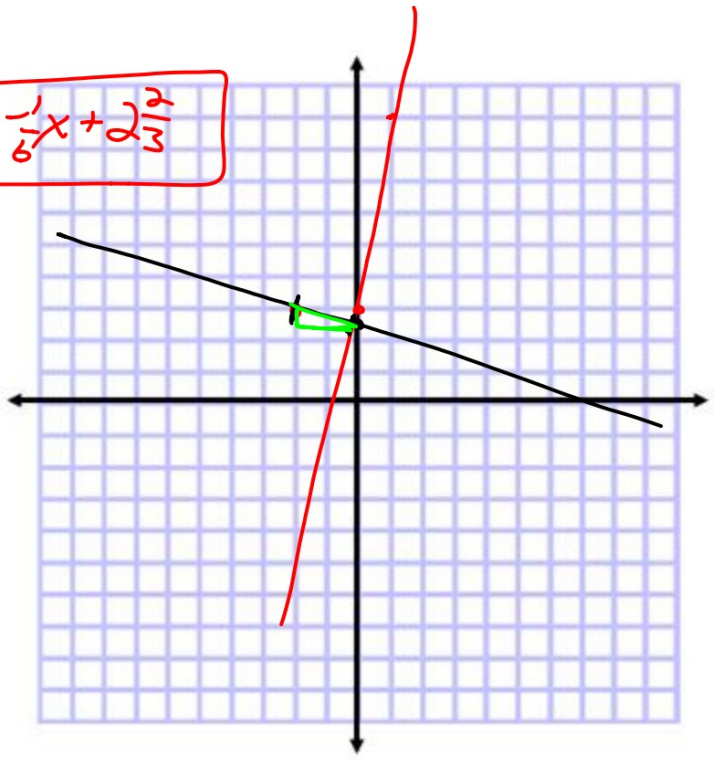
$y = 6x + 3$ $\quad y = -\frac{1}{6}x + 2\frac{2}{3}$

$y = -\frac{1}{6}x + B$

$3 = -\frac{1}{6} \cdot -2 + B$

$3 = \frac{1}{3} + B$

$2\frac{2}{3} = B$



$6x - y = 3$

$y = 6x + 3$

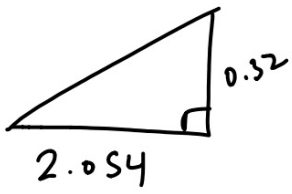
$y = -\frac{1}{6}x + 2\frac{2}{3}$

$6x + 3 = -\frac{1}{6}x + 2\frac{2}{3}$

$+\frac{1}{6}x \quad -3 \qquad +\frac{1}{6}x \quad -3$

$\frac{6\frac{1}{6}x}{6\frac{1}{6}} = \frac{-\frac{1}{3}}{6\frac{1}{6}}$

$x = 0.054$



$y = 6(0.054) + 3$

$y = 3.32$

$(0.054, 3.32)$

$(-2, 3)$

$2.054^2 + .32^2 = h^2$

$4.32 = h^2$

$h = 2.08$

$\longrightarrow y = \frac{2}{3}x + \frac{2}{3}$

$y = -\frac{3}{2}x + 3.5$

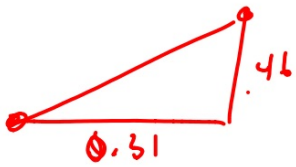
$\frac{2}{3}x + \frac{2}{3} = -\frac{3}{2}x + 3.5$

$+\frac{3}{2}x \quad -\frac{2}{3} \quad +\frac{3}{2}x \quad -\frac{2}{3}$

$\frac{2\frac{1}{6}x}{2\frac{1}{6}} = \frac{2833}{2\frac{1}{6}}$ $\boxed{x = 1.31}$

$y = -\frac{3}{2}(1.31) + 3.5$

$\boxed{y = 1.54}$



$(1.31, 1.54)$ ←

$(1, 2)$ ←

$.31^2 + .46^2 = h^2$

$0.3077 = h^2$

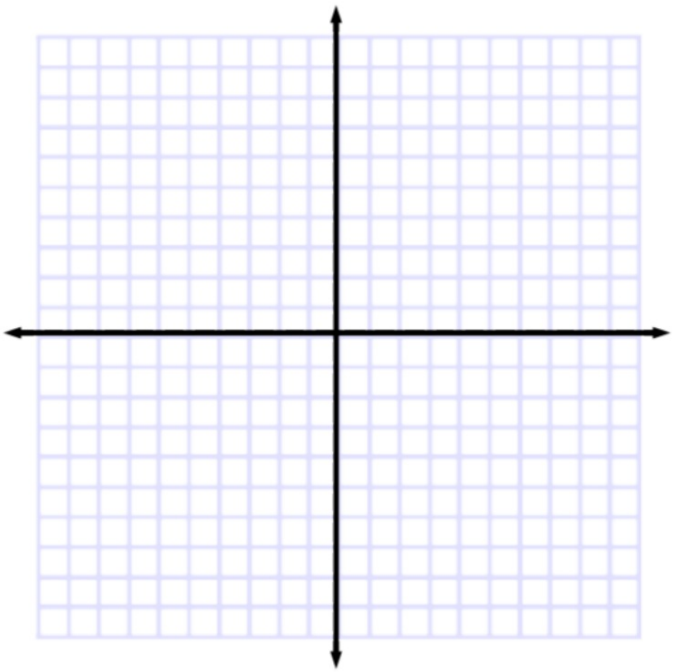
$h = 0.55$

Tell me everything you know about parallel lines...

11, 13, 15 33-40

Parallel lines same distance apart
Use one eq to get a y-intercept (this is your point)
Use other eq (this is your line)

2 **Find the distance between the lines with equations $6x - 2y = 7$ and $y = 3x + 4$.**



Find the distance between the parallel lines with the given equations.

7. $3x - 5y = 1$
$3x - 5y = -3$

8. $y = -\frac{1}{3}x + 3$
$y = -\frac{1}{3}x - 7$