1. Find the slope of the line parallel to the one that passes through (-4, 2) and (0, -5).

$$m = \frac{-5-2}{0+4} = \frac{-7}{4}$$

Parallel → same slope→ $\boxed{\dfrac{-7}{4}}$

2. Find the slope of a line perpendicular to the line y = -2x + 1

⊥→slopes are opp. Reciprocals → $\boxed{m = ½}$

3. Write the equation of a line parallel to 2x + 3y = 9 that passes through the point (-6, -2).

Solve for y to identify the slope

3y = -2x + 9

$y = \frac{-2}{3}$x + 3   parallel → same slope → m = $\frac{-2}{3}$

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

$-2 = \frac{-2}{3}$(-6) + b

-6 = b

$\boxed{y = \dfrac{-2}{3}\text{x - 6}}$

4. Are the following lines parallel, perpendicular, or neither? 4x - y = 1   and   x + 4y = 12

-y = -4x + 1   4y = -x + 12
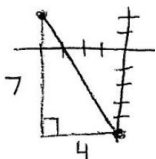
y = 4x - 1 $y = \frac{-1}{4}$x + 3 $\boxed{⊥ \text{ since opp. reciprocals}}$

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

1. Find the distance between the points (-4, 2) and (0, -5).

$$d = \sqrt{(0+4)^2 + (-5-2)^2} = \sqrt{16+49} = \boxed{\sqrt{65}} \approx 8.1$$

$4^2 + 7^2 = c^2$

$c^2 = 16 + 49$

2. Find the midpoint of the segment with endpoints at (-4, 2) and (0. -5).

$$m = \left(\frac{-4+0}{2}, \frac{2-5}{2}\right) = \boxed{\left(-2, \frac{-3}{2}\right)}$$

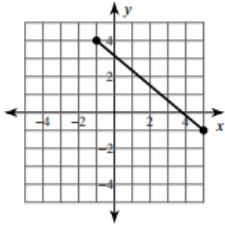3. Write the equation of a line parallel to 7x + 6y = 18 through the point (0, 2).

6y = -7x + 18 $y = \frac{-7}{6}x + b$

$y = \frac{-7}{6}x + 3$ $\boxed{y = \frac{-7}{6}x + 2}$

$m = \frac{-7}{6}$

1. Find the length and midpoint of the segment graphed on the grid below.

$$d = \sqrt{5^2 + 6^2} = \sqrt{25+36} = \boxed{\sqrt{61}} \approx 7.81$$

$$M = \left(\frac{-1+5}{2}, \frac{4-1}{2}\right) = \boxed{(2, \tfrac{3}{2})}$$

2. Write the equation of the line that passes through (-4, -2) and (-3, 5).

$$m = \frac{5+2}{-3+4} = \frac{7}{1} = 7$$

y = 7x + b

-2 = 7(-4) + b $\boxed{y = 7x + 26}$

26 = b

3. Are the following equations parallel, perpendicular, or neither? 4x + 8y = 10 and y - 6 = -2x + 2

8y = -4x + 10

$y = \frac{-1}{2}x - \frac{5}{4}$ y = -2x + 8

$m = \frac{-1}{2}$ m = -2 $\boxed{\text{Neither, not opposites}}$