Name Key

Algebra Skills Review: Parallel and Perpendicular Lines #1

1. Find the slope of a line parallel to the line through the points $(10, 10)$ and $(12, 3)$.

slope $= \frac{3-10}{12-10} = \frac{-7}{2}$ $\quad$ // slope $= \boxed{\frac{-7}{2}}$

2. Determine whether the line passing through the points $P(5, -4)$ and $Q(1, 7)$ is parallel to the line passing through the points $R(11, -7)$ and $S(7, 4)$.

PQ slope: $\frac{7-(-4)}{1-5} = \frac{11}{-4} = -\frac{11}{4}$ $\quad$ RS slope: $\frac{4-(-7)}{7-11} = \frac{11}{-4}$

Yes, PQ and RS are parallel

3. Find the slope of a line parallel to the line $6x - y = 7$.

$6x - y = 7$

$-y = -6x + 7$ $\quad$ // slope $= \boxed{6}$

$y = 6x - 7$

4. Find the slope of a line perpendicular to the line through the points $(-4, 7)$ and $(5, 9)$.

slope: $\frac{9-7}{5-(-4)} = \frac{2}{9}$ $\quad$ $\perp$ slope $= \boxed{-\frac{9}{2}}$

5. Give the slope-intercept form of the equation of the line that is perpendicular to $-9x - 8y = 9$ and contains $(-3, -8)$.

$+9x \quad +9x$

$\frac{-8y}{-8} = \frac{9x+9}{-8}$

$y = -\frac{9}{8}x - \frac{9}{8}$

$\perp$ slope $= \frac{8}{9}$

$\perp$ line: $-8 = \frac{8}{9}(-3) + b$

$-8 = -\frac{8}{3} + b$

$-\frac{16}{3} = b$

$\boxed{y = \frac{8}{9}x - \frac{16}{3}}$

$m = \frac{6}{5}$ →

6. Write the standard form of the equation of the line passing through the point (2, 1) and perpendicular to the line $-5x-6y=-6$.

[A] $-6x+5y=7$ [B] $-5x-6y=4$ [C] $-5x+6y=-4$ [D] $6x-5y=7$

$y=\frac{6}{5}x+\frac{7}{5}$ $y=-\frac{5}{6}x-\frac{2}{3}$ $y=\frac{5}{6}x-\frac{2}{3}$ $y=\frac{6}{5}x-\frac{7}{5}$

$-5x-6y=-6$

$-6y=5x-6$

$y=-\frac{5}{6}x+1$

$y-1=\frac{6}{5}(x-2)$

$y-1=\frac{6}{5}x-\frac{12}{5}$ → $y=\frac{6}{5}x-\frac{7}{5}$

7. Find an equation of the line that passes through the point (1, –4) and is parallel to the line $2x+5y=-1$.

$m=-\frac{2}{5}$

[A] $2x+5y=-3$ [B] $2x+5y=-18$ [C] $x-4y=-1$ [D] $2x-5y=-1$

$y=-\frac{2}{5}x-\frac{3}{5}$ $y=-\frac{2}{5}x-\frac{18}{5}$ $y=\frac{1}{4}x+\frac{1}{4}$ $y=\frac{2}{5}x+\frac{1}{5}$

$2x+5y=-1$

$5y=-2x-1$

$y=-\frac{2}{5}-\frac{1}{5}$

$y-(-4)=-\frac{2}{5}(x-1)$

$y+4=-\frac{2}{5}x+\frac{2}{5}$ → $y=-\frac{2}{5}x-\frac{18}{5}$

8. Which of the following equations has a graph that is parallel to the graph of $4x-2y=7$?

$y=-2x-1$ $y=2x+\frac{7}{2}$ $y=-2x+\frac{7}{2}$

[A] $-2y=4x+2$ [B] $2y=4x+7$ [C] $-4x-2y=-7$

$y=-2x+\frac{7}{2}$ $y=-2x+1$

[D] $7-4x=2y$ [E] $4x+2y=2$

$4x-2y=7$

$-2y=-4x+7$

$-2 \quad -2$

$y=2x-\frac{7}{2}$

9. Determine if the two lines $5x-3y=-15$ and $y=-\frac{3}{5}x-3$ are *parallel*, *perpendicular*, or *neither*.

$-3y=-5x-15$

$y=\frac{5}{3}x+5$

The 2 lines are ⊥ because their slopes are opposite reciprocals

10. Which of the following lines is *not* parallel to $y=-3x-5$?

[A] $y+3x=-6$ [B] $-3y-x=3$ [C] $-3x-y=3$ [D] $-6x-2y=3$

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

↓

not //