

Parallel and Perpendicular Lines

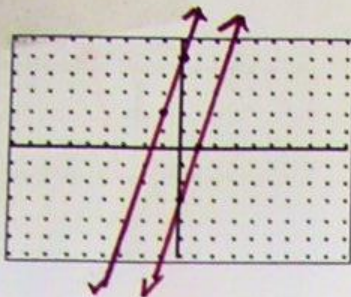
Name: Key

For each problem, graph the pair of equations on the same set of axes. Set your calculator to the window to the right →

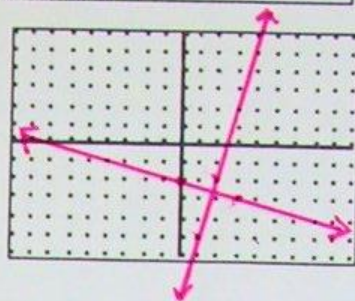
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WINDOW
Xmin=-9
Xmax=9
Xscl=1
Ymin=-6
Ymax=6
Yscl=1
Xres=1
    
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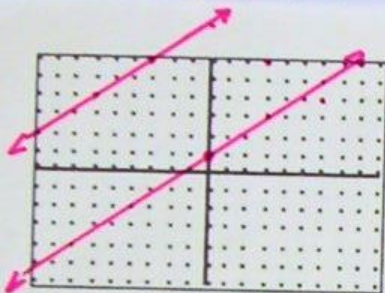
1. $Y_1 = 4x + 5$
 $Y_2 = 4x - 3$



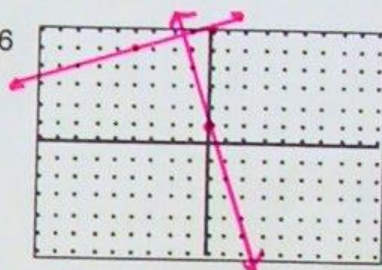
$Y_1 = 3x - 8$
 $Y_2 = -\frac{1}{3}x - 2$



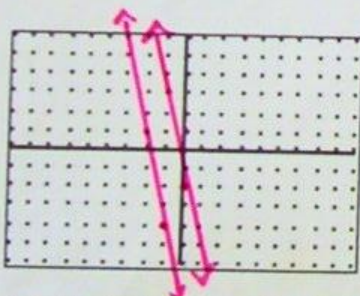
2. $Y_1 = \frac{2}{3}x + 8$
 $Y_2 = \frac{2}{3}x + 1$



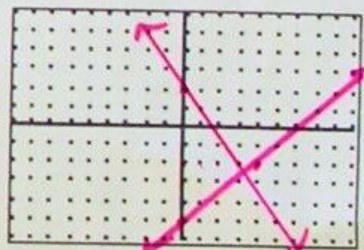
5. $Y_1 = \frac{1}{4}x + 6$
 $Y_2 = -4x + 1$



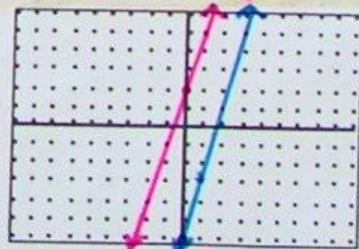
3. $Y_1 = -5x - 2$
 $Y_2 = -5x - 9$



6. $Y_1 = \frac{3}{4}x - 5$
 $Y_2 = -\frac{4}{3}x + 2$

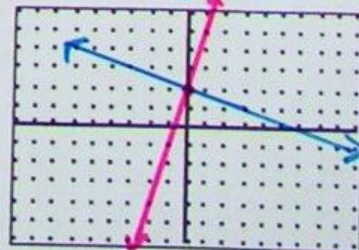


1. What is the same about the *first* three graph pairs? parallel
2. What is the same about the *first* three equation pairs? same slope
3. Write an equation of a line *parallel* to $y = 3x + 2$. $y = 3x + -6$
 Graph both equations on the graphing calculator to check your answer & record here →



AMU

4. What is the same about the *last* three graph pairs? perpendicular
5. What is the same about the *last* three equation pairs? opposite, reciprocal slopes
- Write an equation of a line *perpendicular* to $y = 3x + 2$. $y = -\frac{1}{3}x + 2$
 Graph both equations on the graphing calculator to check your answer & record here →



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Parallel and Perpendicular Lines

// Parallel Lines: Same Slope

⊥ Perpendicular Lines: Slopes are... • opposites
• reciprocals

① $-2x + y = 5$

$y = 2x + 5$
 $m = 2$
 $//m = 2$
 $\perp m = -\frac{1}{2}$

② $y = -6x - 8$

$m = -6$
 $//m = -6$
 $\perp m = \frac{1}{6}$

③ $5y + 35 = 2x$

$5y = 2x - 35$
 $y = \frac{2}{5}x - 7$
 $m = \frac{2}{5}$
 $//m = \frac{2}{5}$
 $\perp m = -\frac{5}{2}$

#1-6 on Hand

④ Equation through $(5, 20)$ and parallel to $y = 3x - 15$.

$m = 3$
 $//m = 3$

$y = mx + b$
 $20 = 3 \cdot 5 + b$
 $20 = 15 + b$
 $b = 5$
 $y = 3x + 5$

Point slope
 $y - 20 = 3(x - 5)$
 $y - 20 = 3x - 15$
 $y = 3x + 5$

#7-14 on Hand

⑤ Equation through $(2, 3)$ and perpendicular to $5y = -x + 40$

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


$m = -\frac{1}{5}$
 $\perp m = 5$

$y = mx + b$
 $3 = 5 \cdot 2 + b$
 $3 = 10 + b$
 $b = -7$

Point Slope
 $y - 3 = 5(x - 2)$
 $y - 3 = 5x - 10$
 $y = 5x - 7$

$y = 5x - 7$

Practice

**Integration: Geometry**
Parallel and Perpendicular Lines

Write an equation in slope-intercept form of the line that passes through the given point and is **parallel** to the graph of each equation.

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


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

3. $5x - 4y = 1$; (-8, 2)

4. $9x + 3y = 8$; (-1, -4)

5. $y = \frac{4}{3}x + 5$; (12, 3)

6. $y = -\frac{3}{4}x + \frac{1}{4}$; (4, -2)



Write an equation in slope-intercept form of the line that passes through the given point and is **perpendicular** to the graph of each equation.

7. $x - 6y = 2$; (2, 4)

8. $3x + 2y = -7$; (1, 1)

9. $5x + 4y = 8$; (10, 5)

10. $4x + 3y = -6$; (2, 1)

11. $y = \frac{1}{4}x - 4$; (-2, 3)

12. $2x + 10y = 3$; (2, 3)

13. $x = 2y - 1$; (0, 0)

14. $4x + 7y = 6$; (-4, 1)