

G.GPE.B.5: Parallel and Perpendicular Lines 5

- 1 The slope of line ℓ is $-\frac{1}{3}$. What is an equation of a line that is perpendicular to line ℓ ?
 - 1) $y + 2 = \frac{1}{3}x$
 - 2) $-2x + 6 = 6y$
 - 3) $9x - 3y = 27$
 - 4) $3x + y = 0$

- 2 Which equation represents a line that is perpendicular to the line whose equation is $-2y = 3x + 7$?
 - 1) $y = x + 7$
 - 2) $2y = 3x - 3$
 - 3) $y = \frac{2}{3}x - 3$
 - 4) $y = \frac{3}{2}x - 3$

- 3 Which equation represents a line perpendicular to the line whose equation is $2x + 3y = 12$?
 - 1) $6y = -4x + 12$
 - 2) $2y = 3x + 6$
 - 3) $2y = -3x + 6$
 - 4) $3y = -2x + 12$

- 4 Which equation represents a line that is perpendicular to the line represented by $2x - y = 7$?
 - 1) $y = -\frac{1}{2}x + 6$
 - 2) $y = \frac{1}{2}x + 6$
 - 3) $y = -2x + 6$
 - 4) $y = 2x + 6$

- 5 Which line is perpendicular to the line whose equation is $5y + 6 = -3x$?
 - 1) $y = -\frac{5}{3}x + 7$
 - 2) $y = \frac{5}{3}x + 7$
 - 3) $y = -\frac{3}{5}x + 7$
 - 4) $y = \frac{3}{5}x + 7$

- 6 Given two lines whose equations are $3x + y - 8 = 0$ and $-2x + by + 9 = 0$, determine the value of b such that the two lines will be perpendicular.

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Answer Section

1 ANS: 3

The slope of $9x - 3y = 27$ is $m = \frac{-A}{B} = \frac{-9}{-3} = 3$, which is the opposite reciprocal of $-\frac{1}{3}$.

REF: 081225ge

2 ANS: 3

Divide the equation $-2y = 3x + 7$ by -2 to transform to the slope intercept form, and note that $m = -\frac{3}{2}$.

Perpendicular lines have slope that are the opposite and reciprocal of each other. The slope of $y = \frac{2}{3}x - 3$ is $\frac{2}{3}$.

REF: 060528a

3 ANS: 2

The slope of $2x + 3y = 12$ is $-\frac{A}{B} = -\frac{2}{3}$. The slope of a perpendicular line is $\frac{3}{2}$. Rewritten in slope intercept form,

(2) becomes $y = \frac{3}{2}x + 3$.

REF: 060926ge

4 ANS: 1

$$m = \frac{-A}{B} = \frac{-2}{-1} = 2$$

$$m_{\perp} = -\frac{1}{2}$$

REF: 061509geo

5 ANS: 2

Transform the equation $5y + 6 = -3x$ to $3x + 5y = -6$. $m = -\frac{A}{B} = -\frac{3}{5}$. The slope of $y = \frac{5}{3}x + 7$ is $\frac{5}{3}$.

REF: 080630a

6 ANS:

6. The slope of the line $3x + y - 8 = 0$ is $m = -\frac{A}{B} = -\frac{3}{1} = -3$. The slope of a line perpendicular to

$3x + y - 8 = 0$ would have a slope the opposite and reciprocal of -3 , or $\frac{1}{3}$. $\frac{1}{3} = -\frac{-2}{b}$.
 $b = 6$

REF: fall9925b