

Best Practice – BP#1 – Linear relationships



AusVELS 10.0 Students are able to solve problems involving parallel and perpendicular lines.

Q: Show that the line with equation $2y = 4x - 9$ is parallel to the line with equation $3y - 6x + 5 = 0$			
Step 1	If two lines are parallel, they have the same gradient: $m_1 = m_2$; so the method to solve this problem is to compare the gradient of both equations.		
Step 2	Rearrange both equations using inverse operations to get the equations in the form: y = mx + c then identify the gradient for both equations the gradient, m, is the coefficient of x (the number in front of x)	$2y = 4x - 9 y = 2x - \frac{9}{2} m_1 = 2$ $3y - 6x + 5 = 0 3y = 6x - 5 y = 2x - \frac{5}{3} m_2 = 2$	
Step 3	Compare the gradient values to show that $m_1 = m_2$ then state your conclusion.	$m_1 = m_2 = 2$ Therefore, the lines are parallel.	

Q: Show that the line with equation $y = 3x - 10$ is perpendicular to the line with equation $6y + 2x + 12 = 0$			
Step 1	If two lines are perpendicular, the product of their gradients is -1. $m_1m_2 = -1$, so the method to solve this problem is to multiply the gradient of both equations to see if it's -1.		
Step 2	Rearrange both equations using inverse operations to get the equations in the form: y = mx + c then identify the gradient for both equations the gradient, m, is the coefficient of x (the number in front of x)	$y = 3x - 10$ $6y + 2x + 12 = 0$ $6y = -2x - 12$ $y = -\frac{1}{3}x - 2$ $m_1 = 3, m_2 = -\frac{1}{3}$	
Step 3	Multiply the gradient values to show that $m_1m_2=-1$ then state your conclusion.	$m_1 = 3$, $m_2 = -\frac{1}{3}$ $m_1 m_2 = 3 \times -\frac{1}{3}$ = -1 Therefore, the lines are perpendicular.	