## Abe Mirza

## **Solving Equations**

Algebra

- 2. Solve the equation x 0.9x + 0.1 = 0.3(x+1)**1**. Solve the equation 14y + 26y + 5 = 39y3. Solve the equation 3n + 14 - 22 - 12 = 6n5. Solve the equation  $\frac{2}{4}x+1=\frac{1}{4}x+6$ 7. Solve the equation 6(4x+1) = 2(2x+3)**9**. Solve the equation -(6k-5) + (-5k+8) = -3**11.** Solve the inequality 2x-5 > -2x+6
- **13**. Solve the inequality 8(t-3) < -4(t-3)

## Answers **1** y = -5 **2.** x = -1 **3.** n = -20/3**4**. y = -2 **5**. x = 20 **6**. x = -9/5 **7**. x = 0**9**. k = 16/11 **10**. x = -305**8**. y = 6**11.** x > 11/4 **12.** 4 < x < 8**13**. *t* < 3 Abe Mirza **Slope and Equation of a Line** Algebra

Given two points  $(x_1, y_1), (x_2, y_2)$ , The slope of the line that goes though these two points will be

Slope =  $\mathbf{m} = \frac{Change \ in \ y}{Change \ in \ x} = \frac{Rise}{Run} = \frac{y_2 - y_1}{x_2 - x_1}$ If m > 0 line always goes from South West to North East If m < 0 line always goes from North West to South East If m = 0 line is always (Horizontal Line) If *m* = *undefined* line is always (Vertical Line) **Example**: Find the slope of the lines that through points (-7,6) and (4,5)  $m = \frac{5-6}{4-(-7)} = \frac{-1}{11}$ **Practice**: Find the slope of the lines through points (-8, -6) and (-4, 15) m =**Slope** –**Intercept Form:** y = mx + bm = Slope, b = y-intercept

Note: If two lines have the same slope they will be parallel. y = -8x + 12 y = -8x - 5Vertical Lines: x = a, x = 3, x = -4Horizontal Lines: y = b, y = 7, y = -2

## Finding x and y intercepts in an equation of line:

Finding **x-intercept**, let y = 0, solve for x Finding y-intercept, let x = 0, solve for y  $\Leftrightarrow$ **Example**: Find x and y intercepts in equation 2x - 3y = 12

- 4. Solve the equation 2(y+5) 4 = 6(y+2) + 2

6. Solve the equation 
$$\frac{2x}{3} + \frac{x}{2} = -\frac{3}{2} + \frac{x}{3}$$

- 8. Solve the equation  $\frac{1}{6}(y+18) + \frac{1}{3}(2y+3) = y+3$
- 10. Solve the equation 0.30(x+15) 0.40(x+25) = 25
- **12**. Solve the inequality 1 < 2x 7 < 9

Finding x-intercept, let  $y = 0 \implies 2x - 3y = 12$  2x - 0 = 12, 2x = 12, x = 6Finding y-intercept, let  $x = 0 \implies 2x - 3y = 12$  0 - 3y = 12, -3y = 12, y = -4**Example**: Find x and y intercepts in equation  $y = -\frac{1}{2}x + 5$  Ans: x = 10, y = 5

**Perpendicular lines:** their slopes are negative reciprocal of each other  $m_1 = \frac{-1}{m_2}$ , y = 2x + 3,  $y = \frac{-1}{2}x + 3$ 

CaseGivenHowExample1 $m = Slope, b = y-intercept$ Substitute them into equation $m = -2, b = y-intercept = 3$ into equation $y = -2x + 3$ 2 $m = Slope, and a point = (x, y)$ Substitute them into equation $y = mx + b$ and then solve for bFind the equation of the line that passes through point (-8, 6) and its slope = $m = -2$ $6 = -2(-8) + b, 6 = 16 + b, b = -10$ Substitute them into equation $y = -2x - 10$ 3Passes though two points $(x_1, y_1).(x_2, y_2)$ First find slope and then use $(x_1, y_1)$ like case 2Find the equation of the line that passes through points (-5, 8) and (5, 18) $m = \frac{18 - 8}{5(-(-5))} = \frac{10}{10} = 1, y = mx + b$ $8 = 1(-5) + b, \Rightarrow 13 = b  y = x + 13$ 4 $m = 0$ and passes though point $(x_1, y_1)$ Always a Horizontal Line: $y = 0 + b = y_1$ Find the equation of the line that passes through point (-4, -6) and its slope = $m = 0$ $y = 0 + b = y_1 = -6$ 5 $m = undefined = \frac{Number}{0}$ and passes though point $(x_1, y_1)$ Always a Vertical Line: $x = x_1$ ,Find the equation of the line that passes through point (3,7) and its slope = $m = undefined$ A vertical line, so its equation is $x = 3$	<b>EXAMPLE</b> How to find the Equation of a line $y = mx + b$				
$b = y$ -interceptequationinto equation $y = -2x + 3$ 2 $m = Slope, and a point = (x, y)$ Substitute them into equation $y = mx + b$ and then solve for bFind the equation of the line that passes through point (-8, 6) and its slope $= m = -2$ 3Passes though two points (x_1, y_1).(x_2, y_2)First find slope and then use $(x_1, y_1)$ like case 2Find the equation of the line that passes through point (-5, 5) and (5, 18)4 $m = 0$ and passes though point $(x_1, y_1)$ Always a Horizontal Line: $y = 0 + b = y_1$ Find the equation of the line that passes through point $(-4, -5)$ and its slope $= m = 0$ $y = 0 + b = y_1 = -6$ 5 $m = undefined = \frac{Number}{0}$ and passes though point $(x_1, y_1)$ Always a Vertical Line: $x = x_1$ ,Find the equation of the line that passes through point $(-4, -6)$ and its slope $= m = 0$ $y = 0 + b = y_1 = -6$ $y = 0 + b = y_1 = -6$ 6Passes though point $(x_1, y_1)$ The new slope $= m$ of the parallel line, so its equation is $x = 3$ 7Passes though point $(x_1, y_1)$ The new slope $= m$ of the given equation of the line that passes through point $(-4, 7)$ and is parallel to its line $y = -2x - 10$ 7Passes though point $(x_1, y_1)$ then do like case 2The new slope of $= m = -2$ $7 = -2(-4) + b$ , $1 = 8 + b$ , $b = 1$ $y = -2x - 10$ 7Passes through point $(0, 1)$ and its slope $= m = -1$ $1 = a + 1$ Find the equation of the line that passes through point $(-4, 7)$ and is parallel to its line $y = -2x - 10$ 7Passes through point $(0, 1)$ and its slope $= m = -1$ $1 = 2, -1/m_1$ of the given equation, Having slope $y = -2x - 10$ 7Passes through point $(0, 1$	Case		-		
2 $m = Slope, and a point = (x, y)$ Substitute them into equation $y = mx + b$ and then solve for bFind the equation of the line that passes through point $(-4, 6)$ and its slope $= m = -2$ 3Passes though two points $(x_1, y_1) \cdot (x_2, y_2)$ First find slope and then use $(x_1, y_1)$ like case 2Find the equation of the line that passes through point $(-4, -5)$ and $(5, 18)$ 4 $m = 0$ and passes though point $(x_1, y_1)$ Always a $Y = 0 + b = y_1$ Find the equation of the line that passes through point $(x_1, y_1)$ 5 $m = undefined = \frac{Number}{0}$ and passes though point $(x_1, y_1)$ Always a $Y = 0 + b = y_1$ Find the equation of the line that passes through point $(x_1, y_1)$ 6Passes though point $(x_1, y_1)$ The new slope $= m$ of the parallel line, so its equation is $x = 3$ 6Passes though point $(x_1, y_1)$ The new slope $= m$ of the parallel line, so its equation is $x = 3$ 7Passes though point $(x_1, y_1)$ and is parallel to a given lineThe new slope $= m$ of the given equation, Having slope $(-4, -7)$ and is parallel to its line given equation, Having slope $m = -1m_1$ of the given equation of the line that passes through point $(-4, 7)$ and is parallel to its line given equation, Having slope $m = -1m_1$ of the given line that passes through point $(-4, 7)$ and is parallel to its line given equation, Having slope $m = -1$ 7Passes through point $(0, 1)$ and its slope $= m = -1$ Find the equation of the line that passes through point $(-4, 7)$ and is parallel to its line given equation, Having slope $m = -1m_1$ of the given equation of a line that passes through point $(-4, 7)$ and is parallel to its line given equation, Having slope $m = -1m_1$ of the given $m = -1/-2 = 1/2 = -5$ </th <th>1</th> <th>m = Slope,</th> <th>Substitute them into</th> <th>m = -2, <math>b = y</math>-intercept = 3 Substitute them</th>	1	m = Slope,	Substitute them into	m = -2, $b = y$ -intercept = 3 Substitute them	
point = $(x, y)$ equation $y = mx + b$ and then solve for bpoint $(-8, 6)$ and its $slope = m = -2$ $6 = -2(-8) + b$ , $6 = 16 + b$ , $b = -10$ Substitute them into equation $y = -2x - 10$ 3Passes though two points $(x_1, y_1), (x_2, y_2)$ First find slope and then use $(x_1, y_1)$ like case 2Find the equation of the line that passes through point $(-8, 6)$ and its slope $= m = -2$ $6 = -2(-8) + b$ , $6 = 16 + b$ , $b = -10$ Substitute them into equation $y = -2x - 10$ 4 $m = 0$ and passes though point $(x_1, y_1)$ Always a $y = 0 + b = y_1$ Find the equation of the line that passes through point $(-4, -6)$ and its slope $= m = 0$ $y = 0 + b = y_1 = -6$ 5 $m = undefined = \frac{Number}{0}$ and passes though point $(x_1, y_1)$ Always a Vertical Line: $x = x_1$ ,Find the equation of the line that passes through point $(-4, -6)$ and its slope $= m = 0$ $y = 0 + b = y_1 = -6$ 6Passes though point $(x_1, y_1)$ The new slope $= m$ of the point $(x_1, y_1)$ Find the equation of the line that passes through point $(-4, 7)$ and its slope $= m = -2$ $7 = -2(-4) + b$ , $1 = 8 + b$ , $b = 1$ $y = -2x + 1$ 7Passes though point $(x_1, y_1)$ and is perpendicular to a given lineThe new slope will be the $m_2 = -1/m_1$ of the given equation, Having slope $m_2$ and $(x_1, y_1)$ then do like case 2Ans: $y = -x + 1$ 7Passes through point $(0, 1)$ and its slope $= m = -1$ $x = y = -2x - 10$ Ans: $y = -x + 1$ 7Passes through point $(0, 1)$ and its slope $= m = -1$ $x = y = -2x - 10$ Ans: $y = -x + 1$ 7Passes through point $(0, 1)$ and its slope $= m = -1$ $x = y = -2x - 10$		b = y-intercept	equation	into equation $y = -2x + 3$	
then solve for b $6 = -2(-8) + b$ , $6 = 16 + b$ , $b = -10$ Substitute them into equation $y = -2x - 10$ 3Passes though two points $(x_1, y_1), (x_2, y_2)$ First find slope and then use $(x_1, y_1)$ like case 2Find the equation of the line that passes through points $(-5, 8)$ and $(5, 18)$ 4 $m = 0$ and passes though point $(x_1, y_1)$ Always a $y = 0 + b = y_1$ Find the equation of the line that passes through point $(-4, -6)$ and its slope $= m = 0$ $y = 0 + b = y_1 = -6$ 5 $m = undefined = \frac{Number}{0}$ and passes though point $(x_1, y_1)$ Always a Vertical Line: $x = x_1$ ,Find the equation of the line that passes through point $(-4, -6)$ and its slope $= m = 0$ $y = 0 + b = y_1 = -6$ $y = 0 + b = y_1 = -6 = y = -6$ 6Passes though point $(x_1, y_1)$ The new slope $= m$ of the parallel line and then do like case 2Find the equation of the line that passes through point $(-4, 7)$ and is parallel to its line $y = -2x - 10$ 7Passes though point $(x_1, y_1)$ and is parallel to a given lineThe new slope will be the $m_2 = -1/m_1$ of the given equation, Having slope $m_2$ and $(x_1, y_1)$ then do like case 2Find the equation of the line that passes through point $(-4, 7)$ and is parallel to its line $y = -2x - 10$ 7Passes through point $(0, 1)$ and its slope $= m = -1$ $m = 0$ if the max slope of $= m = -1/-2 = 1/2 = .5$ $7 = .5(-4) + b$ , $7 = -2 + b$ , $b = 9 = y = .5x + 9$ - Find the equation of a line that P.1) passes through point $(-9, 4)$ and its slope $= m = -2$ $3$ Ans: $y = -x + 1$ P.2) passes through point $(-9, 4)$ and its slope $= m = -2$ $3$ Ans: $y = -x +$	2	m = Slope, and a	Substitute them into	Find the equation of the line that passes through	
3Passes though two points $(x_1, y_1), (x_2, y_2)$ First find slope and then use $(x_i, y_1)$ like case 2Substitute them into equation $y = -2x - 10$ 3Passes though two points $(x_1, y_1), (x_2, y_2)$ First find slope and then use $(x_i, y_1)$ like case 2Find the equation of the line that passes through point $(x_1, y_1)$ 4 $m = 0$ and passes though point $(x_1, y_1)$ Always a Horizontal Line: $y = 0 + b = y_1$ Find the equation of the line that passes through point $(-4, -6)$ and its slope $= m = 0$ $y = 0 + b = y_1 = -6$ 5 $m = undefined = \frac{Number}{0}$ and passes though point $(x_1, y_1)$ Always a Vertical Line: $x = x_1$ ,Find the equation of the line that passes through point $(-4, 7)$ and its slope $= m = -0$ $y = 0 + b = y_1 = -6 = y = -6$ 6Passes though point $(x_1, y_1)$ and is parallel to a given lineThe new slope $= m$ of the parallel line and then do like case 2Find the equation of the line that passes through point $(-4, 7)$ and its parallel to its line $y = -2x - 10$ 7Passes though point $(x_1, y_1)$ and is perpendicular to a given lineThe new slope will be the $m_2 = -1/m_1$ of the given equation, Having slope $m_2$ and $(x_1, y_1)$ then do like case 2Find the equation of the line that passes through point $(-4, 7)$ and is parallel to its line $y = -2x + 1$ 7Passes through point $(0, 1)$ and its slope $= m = -1$ $x_1 = -2 + b$ , $b = 9 y = .5x + 9$ Find the equation of the line that passes through point $(-4, 7)$ and is parallel to its line $y = -2x + 10$ 7Passes through point $(0, 1)$ and its slope $= m = -1$ $x_1 = -2 + b$ , $b = 9 y$		point = (x, y)	equation $y = mx + b$ and	point $(-8, 6)$ and its slope = $m = -2$	
3Passes though two points $(x_1, y_1).(x_2, y_2)$ First find slope and then use $(x_i, y_1)$ like case 2Find the equation of the line that passes through points $(-5, 8)$ and $(5, 18)$ 4 $m = 0$ and passes though point $(x_1, y_1)$ Always a Horizontal Line: $y = 0 + b = y_1$ $m = 18 - 8$ $5 - (-5) = 10 = 1, y = m x + b8 = 1(-5) + b, x = 13 = by = x + 135m = undefined = \frac{Number}{0}and passes thoughpoint (x_1, y_1)Always aVertical Line:x = x_1,Find the equation of the line that passes throughpoint (-4, -6) and its slope = m = 0y = 0 + b = y_1 = -66Passes thoughpoint (x_1, y_1)and is parallel toa given lineThe new slope = m of theparallel line and then dolike case 2Find the equation of the line that passes throughpoint (-4, 7) and its slope = m = -1T = 2(-4) + b, 1 = 8 + b, b = 1y = -2x + 107Passes thoughpoint (x_1, y_1)and is perpendicularto a given lineThe new slope will bethe m_2 = -1/m_1 of thegiven equation, Havingslope m_2 and (x_1, y_1)then do like case 2Find the equation of the line that passes throughpoint (-4, 7) and is parallel to its liney = -2x + 107Passes through point (0, 1) and its slope = m = -1x = 3, mand (x_1, y_1)then do like case 2Find the equation of the line that passes throughpoint (-4, 7) and is parallel to its liney = -2x + 107Passes through point (0, 1) and its slope = m = -1x = -2(-4) + b, 7 = -2 + b, b = 9 y = .5x + 99• Find the equation of a line thatPA1) passes through point (-9, 4) and its slope = m = -\frac{2}{3}Ans: $			then solve for <b>b</b>	6 = -2(-8) + b, $6 = 16 + b$ , $b = -10$	
two points $(x_i, y_1).(x_2, y_2)$ use $(x_i, y_i)$ like case 2points $(-5, 8)$ and $(5, 18)$ 4 $m = 0$ and passes though point $(x_i, y_1)$ always a Horizontal Line: $y = 0 + b = y_1$ $m = 18 - 8$ $5 - (-5) = 10 = 1, y = m x + b8 = 1(-5) + b, \Rightarrow 13 = by = x + 135m = undefined = \frac{Number}{0}and passes thoughpoint (x_i, y_i)Always aHorizontal Line:y = 0 + b = y_1Find the equation of the line that passes throughpoint (-4, -6) and its slope = m = 0y = 0 + b = y_1 = -6y = 0 + b = y_1 = -66Passes thoughpoint (x_i, y_i)The new slope = m of theparallel line and then dolike case 2Find the equation of the line that passes throughpoint (3, 7) and its parallel to its liney = -2x - 107Passes thoughpoint (x_i, y_i)and is perpendicularto a given lineThe new slope will bethe m_2 = -1/m_1 of thegiven equation, Havingslope m_2 and (x_i, y_1)then do like case 2Find the equation of the line that passes throughpoint (-4, 7) and is parallel to its liney = -2x - 107Passes throughpoint (x_i, y_i)and is perpendicularto a given lineThe new slope will bethe m_2 = -1/m_1 of thegiven equation, Havingslope m_2 and (x_i, y_1)then do like case 2Find the equation of the line that passes throughpoint (-4, 7) and is parallel to its liney = -2x - 109Passes through point (0, 1) and its slope = m = -1Ans: y = -2 + 19Passes through point (0, 1) and its slope = m = -1Ans: y = \frac{2}{3} + 109Passes through point (-9, 4) and its slope = m = \frac{2}{3}An$				Substitute them into equation $y = -2x - 10$	
$(x_i, y_i), (x_2, y_2)$ Always a $m = \frac{18-8}{5-(-5)} = \frac{10}{10} = 1, y = m x + b$ 4 $m = 0$ and passes though point $(x_i, y_1)$ Always aFind the equation of the line that passes through point $(-4, -6)$ and its slope = $m = 0$ $y = 0 + b = y_1$ 5 $m = undefined = \frac{Number}{0}$ and passes though point $(x_1, y_1)$ Always a Vertical Line: $x = x_i$ ,Find the equation of the line that passes through point $(3, 7)$ and its slope = $m = 0$ $y = 0 + b = y_1 = -6$ 6Passes though point $(x_1, y_1)$ and is parallel to a given lineThe new slope = $m$ of the parallel line and then do like case 2Find the equation of the line that passes through point $(-4, 7)$ and its parallel to its line $y = -2x - 10$ 7Passes though point $(x_1, y_1)$ and is perpendicular to a given lineThe new slope will be the $m_2 = -1/m_1$ of the given equation, Having slope $m_2$ and $(x_1, y_1)$ then do like case 2Find the equation of the line that passes through point $(-4, 7)$ and is parallel to its line $y = -2x - 10$ 7Passes through point $(x_1, y_1)$ and is perpendicular to a given lineThe new slope will be the $m_2 = -1/m_1$ of the given equation, Having slope $m_2$ and $(x_1, y_1)$ then do like case 2Find the equation of the line that passes through point $(-4, 7)$ and is parallel to its line $y = -2x - 10$ 9Passes through point $(0, 1)$ and its slope = $m = -1$ Find the equation of the line that passes through point $(-4, 7)$ and is parallel to its line $y = -2x - 10$ 9Passes through point $(0, 1)$ and its slope = $m = -1$ Ans: $y = -2x + 1$ P.2) passes through poi	3	0	First find slope and then		
<b>4</b> $m = 0$ and passes though $point(x_i, y_i)$ Always a $y = 0 + b = y_i$ Find the equation of the line that passes through $point(x_i, y_i)$ <b>5</b> $m = undefined = \frac{Number}{0}$ and passes though $point(x_i, y_i)$ Always a $Vertical Line:x = x_i,Find the equation of the line that passes throughpoint(x_i, y_i)6Passes thoughpoint(x_i, y_i)and is parallel toa given lineThe new slope = m of theparallel line and then dolike case 2Find the equation of the line that passes throughpoint (-4, 7) and is parallel to its liney = -2x - 107Passes thoughpoint(x_i, y_i)and is perpendicularto a given lineThe new slope will bethe m_2 = -1/m_1 of thegiven equation, Havingslope m_2 and (x_i, y_1)then do like case 2Find the equation of the line that passes throughpoint (-4, 7) and is parallel to its liney = -2x - 107Passes throughpoint(x_i, y_1)and is perpendicularto a given lineThe new slope will bethe m_2 = -1/m_1 of thegiven equation, Havingslope m_2 and (x_i, y_1)then do like case 2Find the equation of the line that passes throughpoint (-4, 7) and is parallel to its liney = -2x - 107Passes throughpoint (0, 1) and its slope = m = -1Find the equation of the line that passes throughpoint (-4, 7) and is parallel to its liney = -2x - 107Passes through point (0, 1) and its slope = m = -1Find the equation of the line that passes throughpoint (-4, 7) and is parallel to its liney = -2x - 107Passes through point (0, 1) and its slope = m = -1Ans: y = -x + 19$		-	use $(x_1, y_1)$ like case 2	points $(-5,8)$ and $(5,18)$	
4 $m = 0$ and passes though point $(x_1, y_1)$ Always a Horizontal Line: $y = 0 + b = y_1$ Find the equation of the line that passes through point $(-4, -6)$ and its slope = $m = 0$ $y = 0 + b = y_1 = -6$ $y = 0 + b = y_1 = -6$ 5 $m = undefined = \frac{Number}{0}$ and passes though point $(x_1, y_1)$ Always a Vertical Line: $x = x_1$ ,Find the equation of the line that passes through point $(3, 7)$ and its slope = $m = undefined$ A vertical line, so its equation is $x = 3$ 6Passes though point $(x_1, y_1)$ and is parallel to a given lineThe new slope = $m$ of the parallel line and then do like case 2Find the equation of the line that passes through point $(-4, 7)$ and is parallel to its line $y = -2x - 10$ 7Passes though point $(x_1, y_1)$ and is perpendicular to a given lineThe new slope will be the $m_2 = -1/m_1$ of the given equation, Having slope $m_2$ and $(x_1, y_1)$ then do like case 2Find the equation of the line that passes through point $(-4, 7)$ and is parallel to its line $y = -2x + 1$ 7Passes through point $(x_1, y_1)$ and is perpendicular to a given lineThe new slope will be the $m_2 = -1/m_1$ of the given equation, Having slope $m_2$ and $(x_1, y_1)$ then do like case 2Find the equation of the line that passes through point $(-4, 7)$ and is parallel to its line $y = -2x - 10$ • Find the equation of a line that P.1) passes through point $(-9, 4)$ and its slope $= m = -1$ AAns: $y = -x + 1$ P.2) passes through point $(-9, 4)$ and its slope $= m = \frac{2}{3}$ A B.3) passes through point $(-9, 4)$ and its slope $= m = \frac{2}{3}$ A ans: $y = 2x - 1$		$(x_1, y_1), (x_2, y_2)$		$m = \frac{18-8}{5-(-5)} = \frac{10}{10} = 1$ , $y = mx + b$	
and passes though point $(x_i, y_1)$ Horizontal Line: $y = 0 + b = y_1$ point $(-4, -6)$ and its slope $= m = 0$ $y = 0 + b = y_1 = -6$ $y = 0 + b = y_1 = -6$ 5 $m = undefined = \frac{Number}{0}$ and passes though point $(x_1, y_1)$ Always a Vertical Line: $x = x_1$ ,Find the equation of the line that passes through point $(3, 7)$ and its slope $= m$ = undefined A vertical line, so its equation is $x = 3$ 6Passes though point $(x_1, y_1)$ and is parallel to a given lineThe new slope $= m$ of the parallel line and then do like case 2Find the equation of the line that passes through point $(-4, 7)$ and is parallel to its line $y = -2x - 10$ The line has slope of $= m = -2$ $7 = -2(-4) + b$ , $1 = 8 + b$ , $b = 1$ $y = -2x + 1$ 7Passes though point $(x_1, y_1)$ and is perpendicular to a given lineThe new slope will be the $m_2 = -1/m_1$ of the given equation, Having slope $m_2$ and $(x_1, y_1)$ then do like case 2Find the equation of the line that passes through point $(-4, 7)$ and is parallel to its line $y = -2x + 1$ 7Passes through point $(0,1)$ and its slope $= m = -1$ $m = 0$ like case 2Find the equation of the line that passes through point $(-4, 7)$ and is parallel to its line $y = -2x - 10$ The line has slope of $= m = -1/-2 = 1/2 = .5$ $7 = .5(-4) + b$ , $7 = -2 + b$ , $b = 9$ $y = .5x + 9$ • Find the equation of a line that P.1) passes through point $(-9, 4)$ and its slope $= m = -1$ $3$ Ans: $y = \frac{2}{3}x + 10$ Ans: $y = \frac{2}{3}x + 10$ P.3) passes through points $(3, 5)$ and $(8, 15)$ Ans: $y = 2x - 1$				$8 = 1(-5) + b$ , $\Rightarrow 13 = b  y = x + 13$	
Image: point (x_i, y_i) $y = 0 + b = y_i$ $y = 0 + b = y_i = -6$ 5 $m = undefined = \frac{Number}{0}$ and passes though point (x_i, y_i)Always a Vertical Line: $x = x_i$ ,Find the equation of the line that passes through point (3, 7) and its slope = $m = undefined$ A vertical line, so its equation is $x = 3$ 6Passes though point (x_i, y_i)The new slope = $m$ of the parallel line and then do like case 2Find the equation of the line that passes through point (-4, 7) and is parallel to its line $y = -2x - 10$ The line has slope of $= m = -2$ $7 = -2(-4) + b$ , $1 = 8 + b$ , $b = 1$ $y = -2x + 1$ 7Passes though point (x_i, y_i) and is perpendicular to a given lineThe new slope will be the $m_2 = -1/m_1$ of the given equation, Having slope $m_2$ and $(x_i, y_i)$ then do like case 2Find the equation of the line that passes through point (-4, 7) and is parallel to its line $y = -2x - 10$ • Find the equation of a line that P.1) passes through point (-9, 4) and its slope $= m = -1$ Ans: $y = -x + 1$ P.2) passes through point (-9, 4) and its slope $= m = \frac{2}{3}$ Ans: $y = 2x - 1$ 9.3) passes through points (3,5) and (8,15)Ans: $y = 2x - 1$	4	$\boldsymbol{m}=0$	Always a	Find the equation of the line that passes through	
5 $m = undefined = \frac{Number}{0}$ and passes though point $(x_i, y_i)$ Always a Vertical Line: $x = x_i$ ,Find the equation of the line that passes through point $(3, 7)$ and its slope = $m$ = undefined A vertical line, so its equation is $x = 3$ 6Passes though point $(x_i, y_i)$ The new slope = $m$ of the parallel line and then do like case 2Find the equation of the line that passes through point $(-4, 7)$ and its parallel to its line $y = -2x - 10$ 7Passes though point $(x_i, y_i)$ and is perpendicular to a given lineThe new slope will be the $m_2 = -1/m_1$ of the given equation, Having slope $m_2$ and $(x_i, y_i)$ then do like case 2Find the equation of the line that passes through point $(-4, 7)$ and is parallel to its line $y = -2x + 1$ 7Passes though point $(x_i, y_i)$ and is perpendicular to a given lineThe new slope will be the $m_2 = -1/m_1$ of the given equation, Having slope $m_2$ and $(x_i, y_i)$ then do like case 2Find the equation of the line that passes through point $(-4, 7)$ and is parallel to its line $y = -2x - 10$ • Find the equation of a line that P.1) passes through point $(-9, 4)$ and its slope $= m = -1$ Ans: $y = -x + 1$ P.2) passes through point $(-9, 4)$ and its slope $= m = \frac{2}{3}$ Ans: $y = 2x - 1$ 9.3) passes through point $(-9, 4)$ and its slope $= m = \frac{2}{3}$ Ans: $y = 2x - 1$		and passes though		point $(-4, -6)$ and its slope = $m = 0$	
$m = undefined = \frac{1}{0}$ and passes though point $(x_1, y_1)$ Vertical Line: $x = x_1$ ,point $(3, 7)$ and its slope = $m$ = undefined A vertical line, so its equation is $x = 3$ 6Passes though point $(x_1, y_1)$ a di is parallel to a given lineThe new slope = $m$ of the parallel line and then do like case 2Find the equation of the line that passes through point $(-4, 7)$ and is parallel to its line $y = -2x - 10$ The line has slope of $= m = -2$ $7 = -2(-4) + b$ , $1 = 8 + b$ , $b = 1$ $y = -2x + 1$ 7Passes though point $(x_1, y_1)$ and is perpendicular to a given lineThe new slope will be the $m_2 = -1/m_1$ of the given equation, Having slope $m_2$ and $(x_1, y_1)$ then do like case 2Find the equation of the line that passes through point $(-4, 7)$ and is parallel to its line $y = -2x - 10$ • Find the equation of a line that P.1) passes through point $(0, 1)$ and its slope $= m = -1$ Ans: $y = -2x + 1$ P.2) passes through point $(-9, 4)$ and its slope $= m = -1$ Ans: $y = -x + 1$ P.3) passes through point $(-9, 4)$ and its slope $= m = \frac{2}{3}$ Ans: $y = 2x - 1$		$\mathbf{point}(x_1, y_1)$	$y = 0 + b = y_1$	$y = 0 + b = y_1 = -6$ $y = -6$	
and passes though point $(x_1, y_1)$ $x = x_1$ ,A vertical line, so its equation is $x = 3$ 6Passes though point $(x_1, y_1)$ a d is parallel to a given lineThe new slope = $m$ of the parallel line and then do like case 2Find the equation of the line that passes through point $(-4, 7)$ and is parallel to its line $y = -2x - 10$ 7Passes though point $(x_1, y_1)$ and is perpendicular to a given lineThe new slope will be the $m_2 = -1/m_1$ of the given equation, Having slope $m_2$ and $(x_1, y_1)$ then do like case 2Find the equation of the line that passes through point $(-4, 7)$ and is parallel to its line $y = -2x + 1$ 7Passes though point $(x_1, y_1)$ and is perpendicular to a given lineThe new slope will be the $m_2 = -1/m_1$ of the given equation, Having slope $m_2$ and $(x_1, y_1)$ then do like case 2Find the equation of the line that passes through point $(-4, 7)$ and is parallel to its line $y = -2x + 1$ 9.1) passes through point $(0, 1)$ and its slope $= m = -1$ Ans: $y = -x + 1$ P.2) passes through point $(-9, 4)$ and its slope $= m = \frac{2}{3}$ Ans: $y = 2x - 1$ 9.3) passes through points $(3, 5)$ and $(8, 15)$ Ans: $y = 2x - 1$	5	Number	-		
Init point $(x_i, y_i)$ The new slope $= m$ of the point $(x_i, y_i)$ Find the equation of the line that passes through point $(x_i, y_i)$ 6Passes though point $(x_i, y_i)$ a given lineThe new slope $= m$ of the parallel line and then do like case 2Find the equation of the line that passes through point $(-4, 7)$ and is parallel to its line $y = -2x - 10$ 7Passes though point $(x_i, y_i)$ and is perpendicular to a given lineThe new slope will be the $m_2 = -1/m_1$ of the given equation, Having slope $m_2$ and $(x_i, y_i)$ then do like case 2Find the equation of the line that passes through point $(-4, 7)$ and is parallel to its line $y = -2x + 1$ 7Passes though point $(x_i, y_i)$ and is perpendicular to a given lineThe new slope will be the $m_2 = -1/m_1$ of the given equation, Having slope $m_2$ and $(x_i, y_i)$ then do like case 2Find the equation of the line that passes through point $(-4, 7)$ and is parallel to its line $y = -2x - 10$ • Find the equation of a line that P.1) passes through point $(0, 1)$ and its slope $= m = -1$ Ans: $y = -x + 1$ P.2) passes through point $(-9, 4)$ and its slope $= m = \frac{2}{3}$ Ans: $y = \frac{2}{3}x + 10$ Ans: $y = 2x - 1$ P.3) passes through point $(3, 5)$ and $(8, 15)$ Ans: $y = 2x - 1$		$m = unaefinea = \frac{1}{0}$			
6Passes though point $(x_i, y_1)$ and is <b>parallel</b> to a given lineThe new slope = $m$ of the <b>parallel</b> line and then do like case 2Find the equation of the line that passes through point $(-4,7)$ and is <b>parallel</b> to its line $y = -2x - 10$ The line has slope of $= m = -2$ $7 = -2(-4) + b$ , $1 = 8 + b$ , $b = 1$ $y = -2x + 1$ 7Passes though point $(x_1, y_1)$ and is <b>perpendicular</b> to a given lineThe <b>new slope</b> will be the $m_2 = -1/m_1$ of the given equation, Having slope $m_2$ and $(x_1, y_1)$ then do like case 2Find the equation of the line that passes through point $(-4, 7)$ and is <b>parallel</b> to its line $y = -2x - 10$ The line has slope of $= m = -1/-2 = 1/2 = .5$ $7 = .5(-4) + b$ , $7 = -2 + b$ , $b = 9$ $y = .5x + 9$ • Find the equation of a line that <b>P.1</b> ) passes through point $(0, 1)$ and its slope $= m = -1$ Ans: $y = -x + 1$ <b>P.2</b> ) passes through point $(-9, 4)$ and its slope $= m = -\frac{2}{3}$ Ans: $y = \frac{2}{3}x + 10$ Ans: $y = 2x - 1$ <b>P.3</b> ) passes through points $(3, 5)$ and $(8, 15)$ Ans: $y = 2x - 1$			$x = x_1,$	A vertical line, so its equation is $x = 3$	
point $(x_1, y_1)$ and is parallel to a given lineparallel line and then do like case 2point $(-4, 7)$ and is parallel to its line $y = -2x - 10$ 7Passes though point $(x_1, y_1)$ and is perpendicular to a given lineThe new slope will be the $m_2 = -1/m_1$ of the given equation, Having slope $m_2$ and $(x_1, y_1)$ then do like case 2Find the equation of the line that passes through point $(-4, 7)$ and is parallel to its line $y = -2x - 10$ 7Passes though point $(x_1, y_1)$ and is perpendicular to a given lineThe new slope will be the $m_2 = -1/m_1$ of the given equation, Having slope $m_2$ and $(x_1, y_1)$ then do like case 2Find the equation of the line that passes through point $(-4, 7)$ and is parallel to its line $y = -2x - 10$ • Find the equation of a line that P.1) passes through point $(0,1)$ and its slope $= m = -1$ Ans: $y = -x + 1$ P.2) passes through point $(-9, 4)$ and its slope $= m = \frac{2}{3}$ Ans: $y = \frac{2}{3}x + 10$ Ans: $y = 2x - 1$					
and is parallel to a given linelike case 2 $y = -2x - 10$ 7Passes though point $(x_1, y_1)$ and is perpendicular to a given lineThe new slope will be the $m_2 = -1/m_1$ of the given equation, Having slope $m_2$ and $(x_1, y_1)$ then do like case 2Find the equation of the line that passes through point $(-4, 7)$ and is parallel to its line $y = -2x - 10$ 7Passes though point $(x_1, y_1)$ and is perpendicular to a given lineThe new slope will be the $m_2 = -1/m_1$ of the given equation, Having slope $m_2$ and $(x_1, y_1)$ then do like case 2Find the equation of the line that passes through point $(-4, 7)$ and is parallel to its line $y = -2x - 10$ • Find the equation of a line that P.1) passes through point $(0,1)$ and its slope $= m = -1$ Ans: $y = -x + 1$ P.2) passes through point $(-9, 4)$ and its slope $= m = \frac{2}{3}$ Ans: $y = \frac{2}{3}x + 10$ Ans: $y = 2x - 1$ P.3) passes through points $(3,5)$ and $(8,15)$ Ans: $y = 2x - 1$	6	e e	-	Find the equation of the line that passes through	
a did is parallel to a given lineThe final field of a given lineThe line has slope of $= m = -2$ $7 = -2(-4) + b, 1 = 8 + b, b = 1$ $y = -2x + 1$ 7Passes though point $(x_1, y_1)$ and is perpendicular to a given lineThe new slope will be the $m_2 = -1/m_1$ of the given equation, Having slope $m_2$ and $(x_1, y_1)$ then do like case 2Find the equation of the line that passes through point (-4, 7) and is parallel to its line $y = -2x - 10$ The line has slope of $= m = -1/-2 = 1/2 = .5$ $7 = .5(-4) + b, 7 = -2 + b, b = 9 y = .5x + 9$ • Find the equation of a line that P.1) passes through point (0,1) and its slope $= m = -1$ Ans: $y = -x + 1$ P.2) passes through point (-9, 4) and its slope $= m = \frac{2}{3}$ Ans: $y = \frac{2}{3}x + 10$ Ans: $y = 2x - 1$		$\operatorname{point}(x_1, y_1)$	-		
7Passes though point $(x_1, y_1)$ and is <b>perpendicular</b> to a given lineThe <b>new slope</b> will be the $m_2 = -1/m_1$ of the given equation, Having slope $m_2$ and $(x_1, y_1)$ then do like case 2Find the equation of the line that passes through point $(-4, 7)$ and is <b>parallel</b> to its line $y = -2x - 10$ • Find the equation of a line that P.1) passes through point $(0,1)$ and its slope $= m = -1$ Ans: $y = -x + 1$ P.2) passes through point $(-9, 4)$ and its slope $= m = \frac{2}{3}$ Ans: $y = \frac{2}{3}x + 10$ Ans: $y = 2x - 1$		-	nke case 2	-	
7Passes though point $(x_1, y_1)$ and is <b>perpendicular</b> to a given lineThe <b>new slope</b> will be the $m_2 = -1/m_1$ of the given equation, Having slope $m_2$ and $(x_1, y_1)$ then do like case 2Find the equation of the line that passes through point $(-4, 7)$ and is <b>parallel</b> to its line $y = -2x - 10$ • Find the equation of a line that P.1) passes through point $(-9, 4)$ and its slope $= m = -1$ Ans: $y = -x + 1$ P.2) passes through point $(-9, 4)$ and its slope $= m = \frac{2}{3}$ Ans: $y = 2x - 1$ P.3) passes through points $(3, 5)$ and $(8, 15)$ Ans: $y = 2x - 1$		a given line		-	
7Passes though point $(x_1, y_1)$ and is <b>perpendicular</b> to a given lineThe <b>new slope</b> will be the $m_2 = -1/m_1$ of the given equation, Having slope $m_2$ and $(x_1, y_1)$ then do like case 2Find the equation of the line that passes through point $(-4, 7)$ and is <b>parallel</b> to its line $y = -2x - 10$ The line has slope of $= m = -1/-2 = 1/2 = .5$ $7 = .5(-4) + b$ , $7 = -2 + b$ , $b = 9$ $y = .5x + 9$ • Find the equation of a line that P.1) passes through point $(-9, 4)$ and its slope $= m = -1$ Ans: $y = -x + 1$ P.2) passes through point $(-9, 4)$ and its slope $= m = \frac{2}{3}$ Ans: $y = \frac{2}{3}x + 10$ Ans: $y = 2x - 1$					
point $(x_1, y_1)$ and is <b>perpendicular</b> to a given linethe $m_2 = -1/m_1$ of the given equation, Having slope $m_2$ and $(x_1, y_1)$ then do like case 2point $(-4, 7)$ and is <b>parallel</b> to its line $y = -2x - 10$ The line has slope of $= m = -1/-2 = 1/2 = .5$ $7 = .5(-4) + b,  7 = -2 + b,  b = 9 \ y = .5x + 9$ • Find the equation of a line that P.1) passes through point $(0,1)$ and its slope $= m = -1$ Ans: $y = -x + 1$ P.2) passes through point $(-9, 4)$ and its slope $= m = \frac{2}{3}$ Ans: $y = \frac{2}{3}x + 10$ Ans: $y = 2x - 1$				·	
and is <b>perpendicular</b> to a given line <b>i</b> for $(1, y_1)^{T}$ to a given line <b>i</b> for $m_2^{T}$ of $m_1^{T}$ of $m_1^{T$	7	•			
and its perpendiculargiven equation, factoring slope $m_2$ and $(x_1, y_1)$ then do like case 2The line has slope of $= m = -1/-2 = 1/2 = .5$ $7 = .5(-4) + b,  7 = -2 + b,  b = 9 \ y = .5x + 9$ • Find the equation of a line that P.1) passes through point (0,1) and its slope $= m = -1$ Ans: $y = -x + 1$ P.2) passes through point (-9, 4) and its slope $= m = \frac{2}{3}$ Ans: $y = \frac{2}{3}x + 10$ Ans: $y = 2x - 1$					
Image: complexing and $(x_1, y_1)^{T}$ then do like case 2 $7 = .5(-4) + b,  7 = -2 + b,  b = 9  y = .5x + 9$ - Find the equation of a line that P.1) passes through point $(0,1)$ and its slope = $m = -1$ Ans: $y = -x + 1$ P.2) passes through point $(-9, 4)$ and its slope = $m = \frac{2}{3}$ Ans: $y = \frac{2}{3}x + 10$ P.3) passes through points $(3, 5)$ and $(8, 15)$ Ans: $y = 2x - 1$				-	
• Find the equation of a line that P.1) passes through point (0,1) and its slope = $m = -1$ Ans: $y = -x + 1$ P.2) passes through point (-9, 4) and its slope = $m = \frac{2}{3}$ Ans: $y = \frac{2}{3}x + 10$ P.3) passes through points (3, 5) and (8, 15)Ans: $y = 2x - 1$		to a given line	slope $m_2$ and $(x_1, y_1)$	-	
P.1) passes through point (0,1) and its slope = $m = -1$ Ans: $y = -x + 1$ P.2) passes through point (-9, 4) and its slope = $m = \frac{2}{3}$ Ans: $y = \frac{2}{3}x + 10$ P.3) passes through points (3, 5) and (8, 15)Ans: $y = 2x - 1$			then do like case 2	$7 = .5(-4) + b,  7 = -2 + b,  b = 9 \ y = .5x + 9$	
P.2) passes through point (-9, 4) and its slope = $m = \frac{2}{3}$ P.3) passes through points (3, 5) and (8, 15) Ans: $y = \frac{2}{3}x + 10$ Ans: $y = 2x - 1$	- Find the equation of a line that				
<b>P.3</b> ) passes through points (3, 5) and (8, 15) $Ans: y = 2x - 1$	<b>P.1</b> ) passes through point $(0,1)$ and its slope = $m = -1$			Ans: $y = -x + 1$	
	<b>P.2</b> ) passes through point (-9, 4) and its slope = $m = \frac{2}{3}$			<b>Ans:</b> $y = \frac{2}{3}x + 10$	
<b>P.4</b> ) passes through points (-1, -3) and (2, -1) <b>Ans</b> : $y = \frac{2}{3}x - \frac{7}{3}$	P.3) passes through points (3,5) and (8,15)			<b>Ans</b> : $y = 2x - 1$	
	<b>P.4</b> ) passes through points $(-1, -3)$ and $(2, -1)$			<b>Ans:</b> $y = \frac{2}{3}x - \frac{7}{3}$	