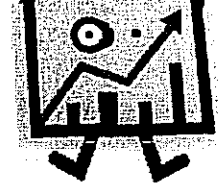
MPM2D March 6 **Equation of a Line Practice Questions**



1. Find the equation of a line

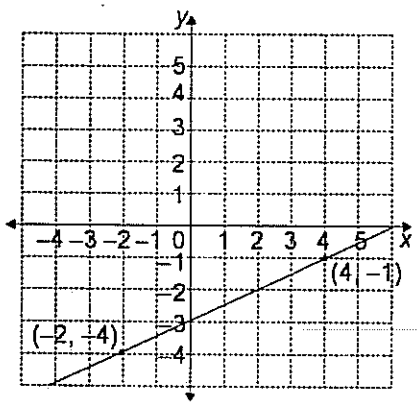
a) with slope 4, passing through (1, 1)

b) parallel to a line with slope 5, and through (−1, 6) → The line goes through (−1, 6)

c) perpendicular to a line with slope 2, and through (2, 5)

d) passing through C(4, 5) and D(5, 1)

e)



f) that has an x-intercept of 3 and a y-intercept of 4.

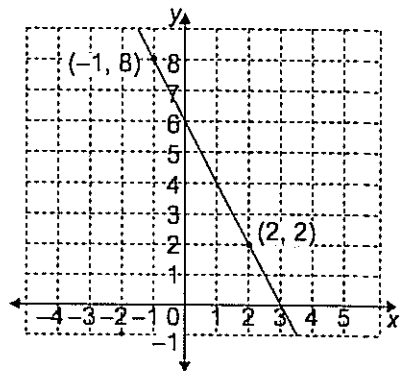
g) with slope −1, passing through (5, 0)

HW **h)** passing through J(3, 2) and K(1, 0)

i) perpendicular to $y = \frac{1}{5}x$, and through the origin

j) that passes through the origin and A(4, 6).

HW **k)**



HW **l)** with slope $\frac{1}{2}$, passing through (8, 2)

m) parallel to $3y = 6x$, and through (−2, 3)

n) perpendicular to $y - x = 1$, and through (3, 3)

HW **o)** passing through G(7, 7) and H(0, 4)

March 6 (Friday) MPM2D

1.a) $y = mx + b$ (equation of a line)

$y = 4x + b$ (1, 1) → when $x=1$, $y=1$

Sub $x=1$ and $y=1$ → $y = 4x + b$

$1 = (4 \cdot 1) + b$

$1 = 4 + b$

$1 - 4 = b$

$-3 = b$

∴ Equation of a line =

$y = 4x - 3$

1b) $y = mx + b$ → $m = 5$

$y = 5x + b$ (−1, 6) when $x=-1$, $y=6$

$6 = 5 \cdot (-1) + b$

$6 = -5 + b$

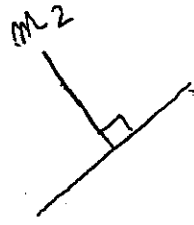
$6 + 5 = b$

$b = 11$

∴ Equation of a line:

$y = 5x + 11$

1c) Line is



→ $m_1 = 2 = \frac{2}{1}$ flip and add −

$m_2 = \frac{-1}{2} = -\frac{1}{2}$

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

$5 = -\frac{1}{2}(2) + b$

$5 = -1 + b$

$5 + 1 = b$

(2, 5)

↳x ↳y

→ $b = 6$

∴ Equation: $y = -\frac{1}{2}x + 6$

C D

1d) $(4,5)$ $(5,1)$ $\quad y = mx + b$

$x_1\ y_1$ $\quad x_2\ y_2$

$$m = \frac{\text{rise}}{\text{run}} = \frac{y_2 - y_1}{x_2 - x_1} = \frac{1-5}{5-4} = \frac{-4}{1} = -4$$

$y = -4x + b \rightarrow$ we use point (C) to find b

$5 = -4(4) + b$

$5 = -16 + b$

$5 + 16 = b$

$b = 21$

$\therefore$ Equation: $y = -4x + 21$

1e) $(-2,-4)$ $(4,-1)$

$x_1\ y_1$ $\quad x_2\ y_2$

$$m = \frac{y_2 - y_1}{x_2 - x_1} = \frac{-1-(-4)}{4-(-2)} = \frac{3 \div 3}{6 \div 3} = \frac{1}{2}$$

$y = \frac{1}{2}x + b$

$-1 = \frac{1}{2}(4) + b$

$-1 = 2 + b$

$-1 - 2 = b$

$-3 = b$

$\therefore$ Equation is $y = \frac{1}{2}x - 3$

f) x intercept of 3 $=$ $(3,0)$

$x_1\ y_1$

y intercept of 4 $=$ $(0,4)$

$x_2\ y_2$

$$m = \frac{4-0}{0-3} = \frac{4}{-3}$$

$y = -\frac{4}{3}x + b = y$ intercept

$\therefore$ Equation is

$y = -\frac{4}{3}x + 4$

March 6 (Friday) MPM2D

1g) $y = -x + b$ $(5, 0)$

$0 = -5 + b$

$5 = b$

$\therefore y = -x + 5$

HW 1h) $J(3, 2)$ $k(1, 0)$

(x_1, y_1) (x_2, y_2)

$m = \frac{0-2}{1-3} = \frac{-2}{-2} = 1$

$y = -x + b \rightarrow$ sub $k(1,0)$

$0 = -1 + b$

$1 = b$

$\therefore$ Equation is $y = -x + 1$

1i) "through orgin" $(0,0) \rightarrow b = 0$

$m = -\frac{5}{1}$ $\therefore y = -5x$

1j) orgin $\rightarrow b = 0$ $A(4, 6)$

(x, y)

$6 = (m \cdot 4) + 0$

$6 = 4m$

$\frac{6}{4} = m$

$\therefore y = \frac{3}{2}x$

HW 1k) $(-1, 8)$ and $(2, 2)$

$m = \frac{2-8}{2--1} = \frac{-6}{3} = -2$

$y = -2x + b$ sub $(2,2)$

$2 = -2(2) + b$

$2 + 4 = b \rightarrow b = 6$

$\therefore y = -2x + 6$

1m) $\frac{3y}{3} = \frac{6x}{3}$ (parallel)

$y = 2x \rightarrow m = 2$

$y = 2x + b$

$3 = 2(-2) + b$

$3 + 4 = b$

$7 = b$

$x \quad y$

$(-2; 3)$

$\therefore$ Equation is

$y = 2x + 7$

1n) $y - x = 1$

$y = 1 + x \rightarrow m = \frac{1}{1}$

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

$y = -x + b$

x, y

$(3, 3)$

$3 = -3 + b$

$3 + 3 = b$

$6 = b$

$\therefore y = -x + 6$

1l) $m = \frac{1}{2}$ $(8, 2)$

$2 = \frac{1}{2}(8) + b$

$2 = 4 + b$

$2 - 4 = b$

$-2 = b$

$\therefore y = \frac{1}{2}x - 2$

10) G(7,7) and H(0,4)

$m = \frac{4-7}{0-7} = \frac{-3}{-7} = \frac{3}{7}$

$y = \frac{3}{7}x + b$ sub H(0,4)

$4 = \frac{3}{7}(0) + b$

$4 = b$

$\therefore y = \frac{3}{7}x + 4$

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Analytic Geometry Unit Outline

The schedule and homework assignments below are subject to change at the teacher's discretion.

Day	Topic	Homework
1 M6	Equation of a Line Practice	Worksheet
2 M9	Midpoint and Median of a Line Segment	Worksheet
3 M10 Tu	Equation of a Right Bisector	Questions at bottom of handout
4 M11 Wed	Distance from the Origin Distance Between Two Points	Worksheet
5 M12 Th	Shortest Distance from Point to Line	Questions at bottom of handout
6 M13 F	Equation of a Circle	Worksheet
7 M 23 M	Classifying Shapes Assignment	
8 M24 T	Verifying Geometry Properties	Worksheet
9 M 25 W	Review	Worksheet
10 M26 TH	Test	