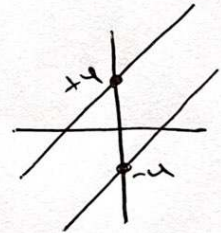# QT Parallel lines

← same gradient

1. Write down the equation of a line parallel to $y = 4x + 4$

$$y = 4x + 8$$

2. Write down the equation of a line parallel to $y = 4x + 4$ which passes through $(0, -4)$

$$y = mx + c \qquad y = 4x - 4$$

3. Find the equation of a line parallel to $4y - 2x + 6 = 0$

$$4y = 2x - 6$$

∴ Parallel

$$y = \frac{1}{2}x + 3$$

$$y = \frac{2x - 6}{4} = \frac{2x}{4} - \frac{6}{4}$$

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

4. Find the equation of a line parallel to $4y - 2x + 6 = 0$ which passes through $(0, 3)$
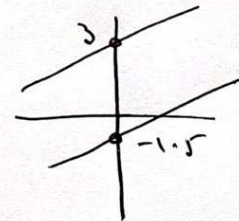
$$y = mx + c$$

$$4y = 2x - 6$$

$$y = \frac{2x - 6}{4} = \frac{2x}{4} - \frac{6}{4}$$

∴ $y = \frac{1}{2}x + 3$

$$y = 0.5x + 3$$

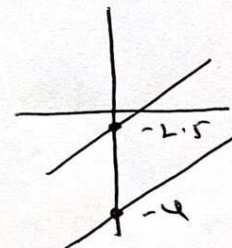$$y = \frac{1}{2}x - \frac{3}{2}$$

$$y = 0.5x - 1.5$$

5. Find the equation of a line parallel to $2y - 3x + 5 = 0$ which passes through $(0, -4)$

$$2y = 3x - 5$$

$$y = \frac{3x - 5}{2} = \frac{3x}{2} - \frac{5}{2}$$

$$y = 1.5x - 2.5$$

∴ $$y = 1.5x - 4$$

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6. Line A passes through the points (4,3) and (8,6). Find the equation of the line parallel to line A that passes through (8,12)

$y = mx + c$ •(8,12)

when
(8,12)

$\dfrac{y_2 - y_1}{x_2 - x_1} = \dfrac{6-3}{8-4} = \dfrac{3}{4}$

$y = \dfrac{3}{4}x + c$.

$12 = \dfrac{3}{4}(8) + c$

$12 = 6 + c$

$6 = c$

$\therefore y = \dfrac{3}{4}x + 6$

7. Line A passes through the points (1,2) and (4,6)
   Line B passes through the points (4,7) and (6, 11)
   Determine whether Line A and line B are parallel.

Line A $= \dfrac{y_2 - y_1}{x_2 - x_1} = \dfrac{6-2}{4-1} = \dfrac{4}{3} = 1\cdot\dfrac{3}{2}$

Line B $= \dfrac{y_2 - y_1}{x_2 - x_1} = \dfrac{11-7}{6-4} = \dfrac{4}{2} = 2$

Not parallel

8. Line A passes through the points (1,2) and (4,6)   1,1   4,7
   Line B passes through the points (4,7) and (k, 14)
   Line A and B are parallel.
   Find the value of k.

Line A $\dfrac{y_2 - y_1}{x_2 - x_1} = \dfrac{7-1}{4-1} = \dfrac{6}{3} = 2$.

Line B $\dfrac{y_2 - y_1}{x_2 - x} = 2$

$\dfrac{14-7}{k-4} \neq \dfrac{2}{1}$

$7 = 2(k-4)$
$7 = 2k - 8$
$15 = 2k$
$7.5 = k$