

10:08 | Parallel and Perpendicular Lines

Name: _____

Class: _____

Examples



If a line is $y = mx + b$, then its gradient is m .

1 Find the slope (gradient) of these lines.

a $y = 4 - 3x$

$\therefore y = -3x + 4$

Slope = -3

b $2x - y = 6$

$\therefore 2x - 6 = y$

Gradient = 2

c $2y = x$

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

Slope = $\frac{1}{2}$

d $3x + 2y = 6$

$2y = -3x + 6$

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

Gradient = $-\frac{3}{2}$

2 Which of these lines are parallel or perpendicular?

A: $3x + y = 4$

$\therefore y = -3x + 4$

Gradient = -3

B: $y = 3x$

Gradient = 3

C: $x - 3y = 4$

$\therefore y = \frac{1}{3}x - \frac{4}{3}$

Gradient = $\frac{1}{3}$

D: $3x - y = 10$

$\therefore y = 3x - 10$

Gradient = 3

$B \parallel D$ as gradients are equal.

$A \perp C$ as $-3 \times \frac{1}{3} = -1$ (Product of gradients is -1.)

Exercise

1 Use $y = mx + b$ to find the slope of the lines in columns A and B.

Column A

a $x + y = 4$

b $y = 4x - 2$

c $y = 7 - x$

d $4x + 5y = 8$

e $y = -2x$

f $2x + 3y = 6$

g $x + 4y = 0$

h $3x = y + 5$

i $2x = 7y + 5$

j $y = 5x$

k $3x + y = 6$

l $10x - 2y = 7$

Column B

a $x = 3 - y$

b $4x - y + 2 = 0$

c $x - y = 6$

d $5x = 4y$

e $2y = x + 4$

f $2x - 3y = 6$

g $4x - y + 2 = 0$

h $x = 3y + 7$

i $7x + 2y = 8$

j $5x + y = 10$

k $x = 3y - 9$

l $y = 5x$

2 Which pairs of lines in columns A and B are: a parallel? b perpendicular?

Fun Spot 10:08 | What do you call two spiders who just got married?

Match the letters with the gradients of the lines in the answers.

B $y = 6x - 2$

E $6x + y = 0$

L $3x + 2y = 12$

N $3x - 2y = 6$

S $x = 6y$

W $2x = 3y$

Y $x + 6y = 12$

$\frac{3}{2}$	-6	$\frac{2}{3}$	$\frac{3}{2}$	$\frac{1}{6}$	$\frac{2}{3}$	6	6	$\frac{1}{6}$	

10:08 Parallel and Perpendicular Lines

1	Column A:	a -1	b 4	c -1	d $-\frac{4}{5}$	e -2	f $-\frac{2}{3}$
		g $-\frac{1}{4}$	h 3	i $\frac{2}{7}$	j 5	k -3	l 5
	Column B:	a -1	b 4	c 1	d $\frac{5}{4}$	e $\frac{1}{2}$	f $\frac{2}{3}$
		g 4	h $\frac{1}{3}$	i $-\frac{7}{2}$	j -5	k $\frac{1}{3}$	l 5
2	a	a, b, l	b	c, d, e, g, i, k.			