



"Full Coverage": Straight Line Equations

This worksheet is designed to cover one question of each type seen in past papers, for each GCSE Higher Tier topic. This worksheet was automatically generated by the DrFrostMaths Homework Platform: students can practice this set of questions interactively by going to www.drfrostmaths.com/homework, logging on, *Practise* → *Past Papers/Worksheets* (or *Library* → *Past/Past Papers* for teachers), and using the 'Revision' tab.

Question 1

Categorisation: Appreciate that any point on a line must satisfy its corresponding equation, and use to determine a y value from an x value, or vice versa.

[Edexcel GCSE Nov2005-3I Q26a, Nov2005-5H Q15a]

A straight line has equation $y = 2x - 3$

The point P lies on the straight line.

The y coordinate of P is -4 .

Find the x coordinate of P .

.....

Question 2

Categorisation: Determine the coordinate of the point where a line crosses the x or y -axis.

Determine the coordinate of the point where $y = 2x + 6$ crosses the x -axis.

.....

Question 3

Categorisation: Determine the gradient of a line using two points.

[Edexcel GCSE June2013-2H Q13b]

P is the point $(-4, 4)$ Q is the point $(1, -5)$

Find the gradient of PQ .

.....

Question 4

Categorisation: Determine gradient in the context of bounds.

[Edexcel GCSE Nov2006-6H Q21ai]

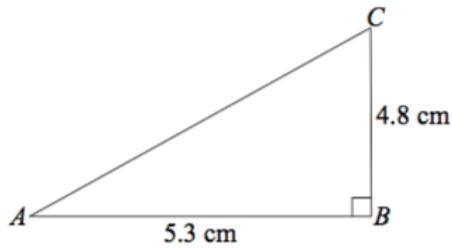


Diagram **NOT** accurately drawn

In triangle ABC, angle ABC = 90°

AB = 5.3 cm, correct to 2 significant figures.

BC = 4.8 cm, correct to 2 significant figures.

The base, AB, of the triangle is horizontal.

Calculate the lower bound for the gradient of the line AC.

.....

Question 5

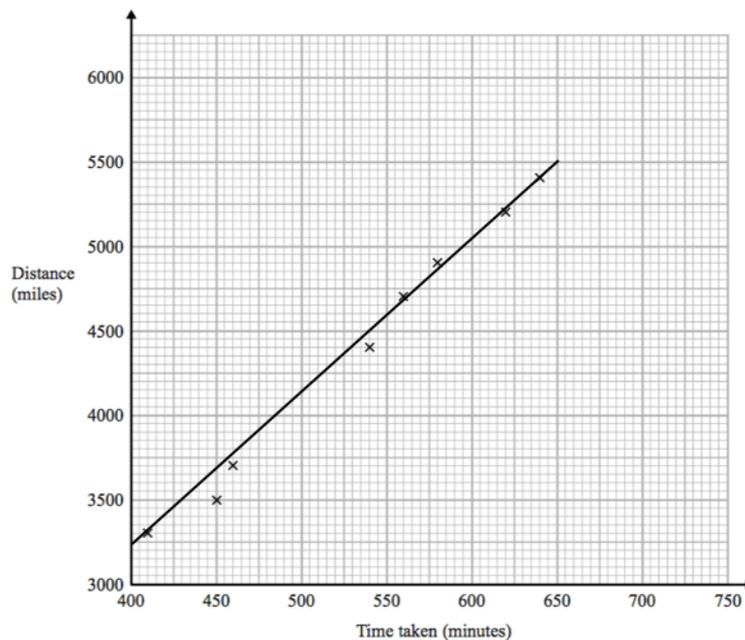
Categorisation: Determine gradient from a graph in an applied context.

[Edexcel GCSE(9-1) Mock Set 3 Autumn 2017 2F Q19bi Edited, 2H Q1bi]

Oliver records the distance from London to each of eight cities in the USA.

He also records the time taken to fly from London to each of these cities.

The scatter graph shows this information.



Calculate the gradient of the line of best fit.

.....

Question 6

Categorisation: Determine the gradient of a line using an equation (not in the form $y = mx + c$)

[Edexcel IGCSE Jan2017-4H Q12a]

The straight line **L** has equation $3x - 2y = 15$

Find the gradient of **L**.

Gradient =

Question 7

Categorisation: Determine whether two lines are parallel.

[Edexcel IGCSE Jan2016-3H Q18 Edited]

A is the point with coordinates (1,3) *B* is the point with coordinates (-2, -1)

The line **L** has equation $3y = 4 - 2x$

Is line **L** parallel to *AB* ?

Yes No

Question 8

Categorisation: Determine whether two lines are perpendicular.

[Edexcel GCSE Nov2014-1H Q24]

A is the point with coordinates (1,3) *B* is the point with coordinates (4, -1) .

The straight line **L** goes through both *A* and *B*.

Is the line with equation $2y = 3x - 4$ perpendicular to line *L* ?

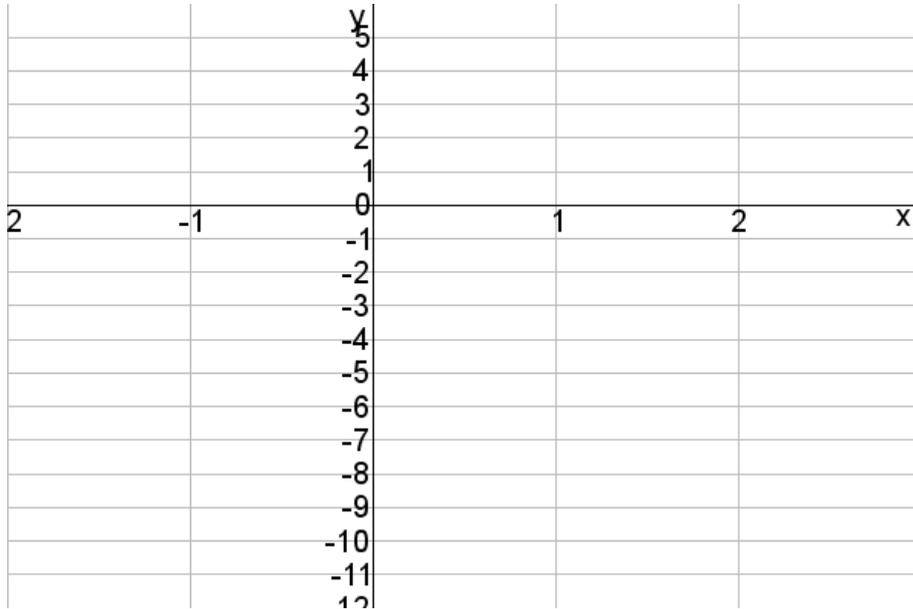
Yes No

Question 9

Categorisation: Sketch a line using its equation.

[Edexcel IGCSE Jan2015-4H Q4]

On the grid, draw the graph of $y = 3x - 4$ for values of x from -2 to 3 .

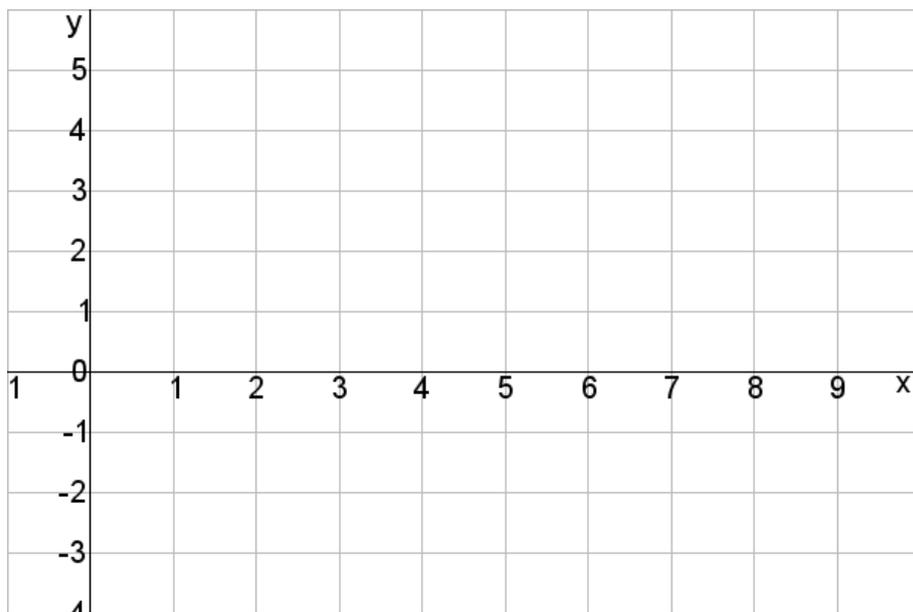


Question 10

Categorisation: As above, but for an equation not in the form $y = mx + c$.

[Edexcel IGCSE Nov2009-4H Q9a]

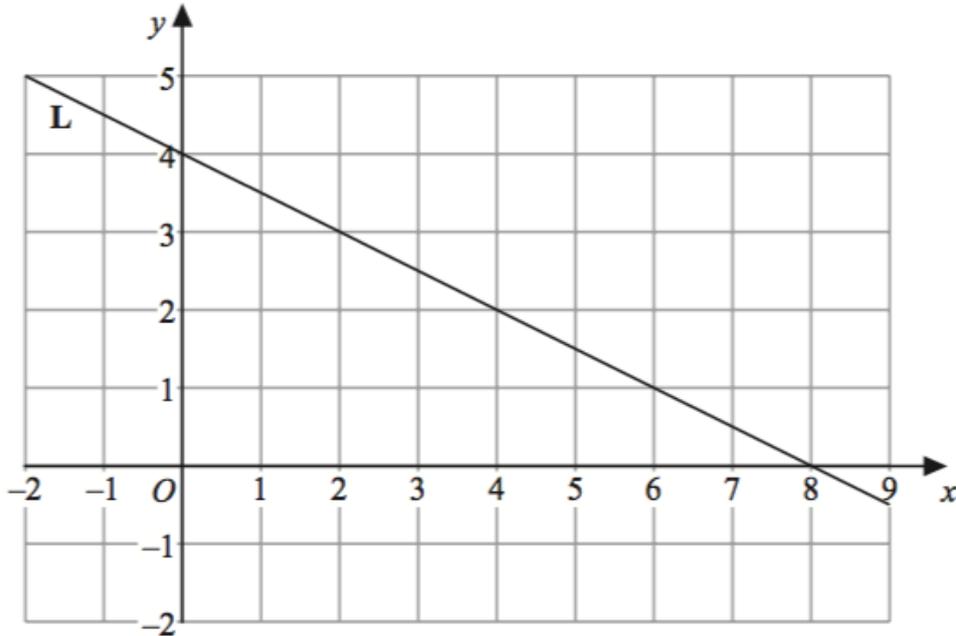
On the grid, draw the graph of $2x - 3y = 6$ from $x = 0$ to $x = 9$



Question 11

Categorisation: Determine the equation of a line given its sketch.

[Edexcel IGCSE June2010-4H Q12a]



Find the equation of the line L.

.....

Question 12

Categorisation: Determine an equation of a line using two coordinates (where one is on the y-axis).

[Edexcel IGCSE Nov-2010-4H Q12a]

The line L cuts the y -axis at (0, 5).

L also passes through the point (2, 1).

Find the equation of the line L.

.....

Question 13

Categorisation: Determine the equation of a line parallel to another that passes through a given point.

[Edexcel GCSE Nov2015-2H Q17]

L_1 and L_2 are parallel lines.

The equation of L_1 is $y = 3x + 2$

L_2 passes through the point (3,4) .

Find an equation for L_2 .

.....

Question 14

Categorisation: As above, but parallel to an equation not in the form $y = mx + c$.

[Edexcel IGCSE May2012-3H Q14b]

The equation of a line L is $2x - 3y = 6$

Find the equation of the line which is parallel to L and passes through the point (6, 9).

.....

Question 15

Categorisation: Determine the equation of a line that goes through two points, leaving the equation in the form $ax + by = c$ or $ax + by + c = 0$, where a, b, c are integers.

[Edexcel IGCSE May2016-3H Q13]

The straight line L passes through the points $(-2,3)$ and $(6,9)$.

Find an equation of the line that is parallel to L and passes through the point $(5, -1)$

Give your answer in the form $ax + by = c$ where a, b and c are integers.

.....

Question 16

Categorisation: Determine the equation of a line that is perpendicular to another line and passes through a given point.

[Edexcel GCSE Nov2006-5H Q16c Edited]

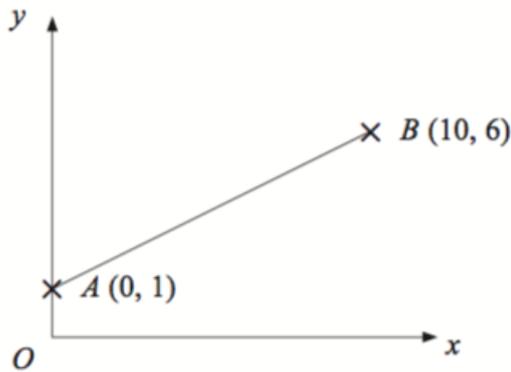


Diagram NOT accurately drawn

Find the equation of the line perpendicular to AB passing through B .

.....

Question 17

Categorisation: Solve multi-step problems involving a mixture of parallel/perpendicular lines and intercepts with the coordinate axes.

[Edexcel GCSE Nov2012-1H Q23]

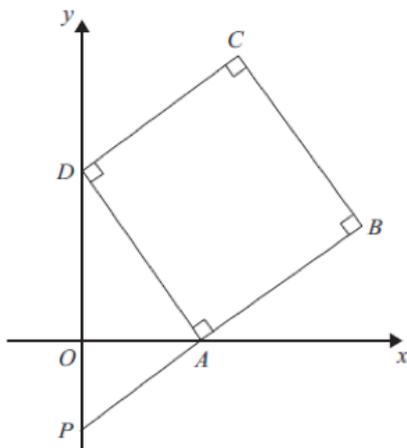


Diagram NOT accurately drawn

$ABCD$ is a square. P and D are points on the y -axis. A is a point on the x -axis.

PAB is a straight line.

The equation of the line that passes through the points A and D is $y = -2x + 6$.

Find the length of PD.

$PD = \dots\dots\dots$

Question 18

Categorisation: Divide a line in a given ratio.

[Edexcel GCSE(9-1) Mock Set 1 Autumn 2016 - 2H Q19]

P has coordinates $(-9,7)$, Q has coordinates $(11,12)$

M is the point on the line segment PQ such that $PM:MQ = 2:3$

Line L is perpendicular to the line segment PQ . L passes through M .

Find an equation of L .

$\dots\dots\dots$

Question 19

Categorisation: As above.

[Edexcel GCSE Jun2015-2H Q12]

The points A , B and C lie in order on a straight line.

The coordinates of A are $(2,5)$

The coordinates of B are $(4,p)$

The coordinates of C are $(q,17)$

Given that $AC = 4AB$, find the values of p and q .

$\dots\dots\dots$

Question 20

Categorisation: Determine the coordinate of the point of intersection of two lines.

[Edexcel IGCSE Jan2012-4H Q13b]

Find the coordinates of the point of intersection of the line with equation $3x + 4y = 10$ and the line with equation $5x - 6y = 23$

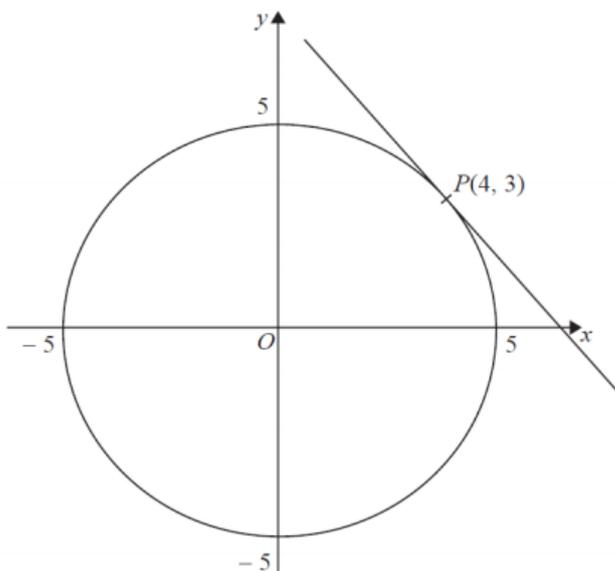
.....

Question 21

Categorisation: Determine the equation of a tangent to a circle.

[Edexcel Specimen Papers Set 1, Paper 2H Q23]

Here is a circle, centre O , and the tangent to the circle at the point $P(4,3)$ on the circle.



Find an equation of the tangent at the point P .

.....

Question 22

Categorisation: Determine the intercept of a tangent to a circle with the coordinate axes.

[Edexcel Specimen Papers Set 2, Paper 1H Q22]

The line l is a tangent to the circle $x^2 + y^2 = 40$ at the point A . A is the point $(2,6)$.

The line l crosses the x -axis at the point P .

Work out the area of triangle OAP .

..... $units^2$

Answers

Question 1

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

Question 2

$(-3, 0)$

Question 3

-1.8

Question 4

0.89

Question 5

9

Question 6

Gradient = 1.5

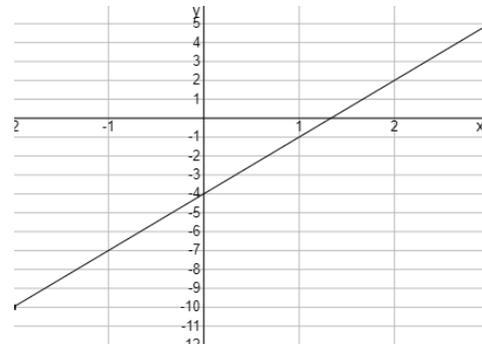
Question 7

No

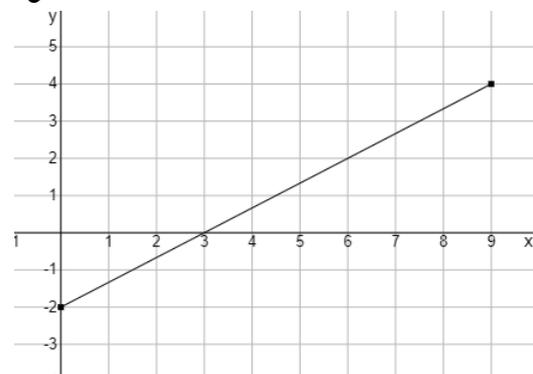
Question 8

No

Question 9



Question 10



Question 11

$$y = -\frac{1}{2}x + 4$$

Question 12

$$y = -2x + 5$$

Question 13

$$y = 3x - 5$$

Question 14

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

Question 15

$$4y - 3x = -19$$

Question 16

$$y = -2x + 26$$

Question 17

$$PD = 7.5$$

Question 18

$$y = -4x + 5$$

Question 19

$$p = 8, q = 10$$

Question 20

$$\left(4, -\frac{1}{2}\right)$$

Question 21

$$y = -\frac{4}{3}x + \frac{25}{3}$$

Question 22

60