

Examination Practice Questions

You should have:

A ruler, protractor, compasses, a pen, pencil, eraser, calculator.
For some questions, you may need tracing paper.

Instructions

- Use **black** ink or ball-point pen.
- Answer the questions in the spaces provided – *there may be more space than you need.*
- **Calculators may be used.**

Information

- The marks for each question are shown in brackets.
- Use the number of marks for each question as a guide as to how much time to spend on each question. As a rough guide, you can multiply the number of marks by 1.2 to see how many minutes you should spend on a question.
- Questions been carefully compiled from or modelled on a variety of past papers and will generally get more challenging as the document progresses. Some of the later questions will go beyond the core grade level for this topic.

Advice

- Read each question carefully before you start to answer it.
- Don't forget to have fun.
- Check your answers at the end.

Q1.

AtoZrevision.com

The straight line L has equation $y = -4x + 5$

Write down the gradient of a straight line that is perpendicular to L.

ANY
VALUE

$$y = \frac{1}{4}x \pm \square$$

(1 mark)

Q2.

AtoZrevision.com

Here are the equations of 5 straight lines.

P $y = 2x + 5$

Q $y = -2x + 5$

R $y = x + 5$

S $y = -\frac{1}{2}x + 6$

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

Select the letter of the line that is perpendicular to $y = 2x - 1$

S

(1 mark)

Q3.

AtoZrevision.com

Write the equation of a straight line that is perpendicular to the line with equation $y = 2x - 3$

ANY
VALUE

$$y = -\frac{1}{2}x \pm \square$$

(1 mark)

Q4.

AtoZrevision.com

The straight line, L has equation $4x - 3y = 6$. Write down the gradient of a line that is perpendicular to L.

$$4x - 6 = 3y$$

$$y = \frac{4}{3}x - 2$$

m_1

m_1

$$y = -\frac{3}{4}x \pm \square$$

ANY
VALUE

(1 mark)

Q5.

AtoZrevision.com

Line L_1 has equation $y = 3x + 5$ → GRADIENT = 3
 Line L_2 has equation $6y + 2x = 1$

Show that L_1 is perpendicular to L_2 .

$$\begin{aligned} \downarrow 6y &= -2x + 1 \\ y &= -\frac{1}{3}x + \frac{1}{6} \end{aligned}$$

$$3 \times -\frac{1}{3} = -1 \quad \therefore \text{PERPENDICULAR}$$

(2 marks)

Q6.

AtoZrevision.com

A straight line passes through the point (8,1) and is perpendicular to the line $y = 4x - 2$.

Find the equation of the line, giving your answer in the form $y = mx + c$.

$$\text{GRADIENT} = -\frac{1}{4} \quad (m_1)$$

$$1 = -\frac{1}{4}(8) + c$$

$$c = 3 \quad (m_1)$$

$$(A_1)$$

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

(3 marks)

Q7.

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The straight line L_1 has equation $y = 3x - 4$

The straight line L_2 is perpendicular to L_1 and passes through the point (9, 5).

Find an equation of line L_2 .

$$\text{GRADIENT} = -\frac{1}{3} \quad (m_1)$$

$$5 = -\frac{1}{3}(9) + c$$

$$c = 8 \quad (m_1)$$

$$(A_1)$$

$$y = -\frac{1}{3}x + 8$$

(3 marks)

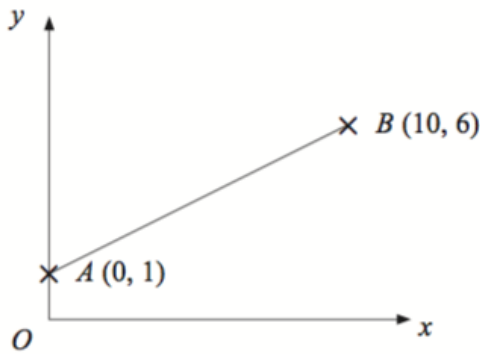


Diagram NOT accurately drawn

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

GRADIENT OF AB = $\frac{5}{10} = \frac{1}{2}$ m_1

$6 = -2(10) + C$

$C = 26$ m_1

$y = -2x + 26$ A_1

(3 marks)

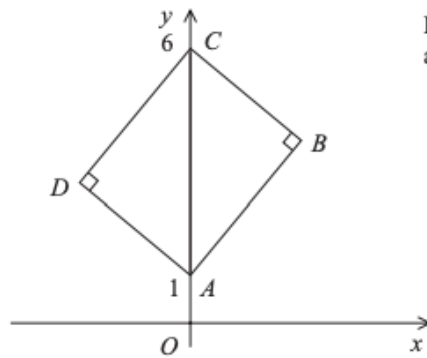


Diagram NOT accurately drawn

ABCD is a rectangle.

A is the point (0,1).

C is the point (0,6).

The equation of the straight line through A and B is $y = 2x + 1$

Find the equation of the straight line through B and C.

NEW GRADIENT IS $-\frac{1}{2}$ m_1

$6 = -\frac{1}{2}(0) + C$

$C = 6$ m_1

$y = -\frac{1}{2}x + 6$ A_1

(3 marks)

The straight line L_1 has equation $2y = 6x - 5$

$$y = 3x - 5$$

The straight line L_2 is perpendicular to L_1 and passes through the point $(9, -1)$

Find an equation for L_2

Give your answer in the form $ay + bx = c$

NEW GRADIENT IS $-\frac{1}{3}$ m_1

$$-1 = -\frac{1}{3}(9) + c$$

$$c = 2 \quad m_1$$

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

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

(3 marks)

The straight line L passes through the points $(4, -1)$ and $(6, 4)$

The straight line M is perpendicular to L and intersects the y -axis at the point $(0, 8)$

Find the coordinates of the point where M intersects the x -axis.

GRADIENT IS $\frac{4 - (-1)}{6 - 4} = 2.5$ m_1

GRADIENT OF m IS $-\frac{1}{2.5} = -0.4$

m 's y INTERCEPT IS 8

$$M: y = -0.4x + 8 \quad m_1$$

* WHERE y IS 0 m_1

$$-0.4x + 8 = 0$$

$$\therefore x = 20$$

$$(20, 0)$$

A_1 (4 marks)

The straight line L_1 has equation $y = 6 - 2x$
 The straight line L_2 is perpendicular to L_1 and passes through the point $(4,7)$

Find the coordinates of the point where the line L_2 crosses the x -axis.

L_2 GRADIENT = $+\frac{1}{2}$

$$7 = \frac{1}{2}(4) + c$$

$$c = 5$$

$$L_2: y = \frac{1}{2}x + 5$$

WHERE $y = 0$

$$\frac{1}{2}x + 5 = 0$$

$$x = -10$$

A_1

$$(-10, 0)$$

(4 marks)

The equation of line L is $2x + y = 3 \rightarrow y = -2x + 3$

Line N is perpendicular to line L and passes through $(-5,4)$

Work out the point of intersection of line N and the x -axis.

GRADIENT OF N: $+\frac{1}{2}$

$$4 = \frac{1}{2}(-5) + c$$

$$c = 6.5$$

$$N: y = \frac{1}{2}x + 6.5$$

when $y = 0$: $\frac{1}{2}x + 6.5 = 0$

$$\therefore x = -13$$

(4 marks)

The line L passes through the points with coordinates $(-3,1)$ and $(2,-2)$

Find an equation of the line that is perpendicular to L and passes through the point with coordinates $(-6,4)$

Give your answer in the form $ax + by + c = 0$ where a, b and c are integers.

GRADIENT: $\frac{-2-1}{2-(-3)} = -\frac{3}{5}$ m_1

NEW GRADIENT IS $\frac{5}{3}$

$$4 = \frac{5}{3}(-6) + c \quad m_1$$

$$c = 14 \quad A_1$$

$$y = \frac{5}{3}x + 14$$

$$5x - 3y + 42 = 0 \quad A_1$$

(4 marks)

The line l_1 passes through the points $(-1,-4)$ and $(2,8)$.

The line l_2 is perpendicular to l_1 and passes through the point $(1,1)$.

Find the equation of the line l_2 in the form $y = mx + c$.

GRADIENT $\frac{8-(-4)}{2-(-1)} = 4 \quad m_1$

l_2 GRADIENT : $-\frac{1}{4}$

$$1 = -\frac{1}{4}(1) + c \quad m_1$$

$$c = \frac{5}{4} \quad A_1$$

$$y = -\frac{1}{4}x + \frac{5}{4} \quad A_1$$

(4 marks)

The straight line L_1 has equation $x + 2y = 4$

The straight line L_2 passes through the points $(-1, -7)$ and $(7, 9)$.

Michael says that the lines L_1 and L_2 are perpendicular.

Is Michael correct?

GRADIENT

$$\frac{9 - (-7)}{7 - (-1)} = 2 \quad m_1$$

GRADIENT

$$2y = -x + 4$$

$$y = -\frac{1}{2}x + 2 \quad A_1$$

$$As \quad 2 \times -\frac{1}{2} = -1$$

MICHAEL IS CORRECT $\ddot{\smile}$

(3 marks)