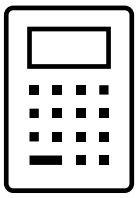
Surname:	Forename(s):

GCSE Mathematics

Simultaneous Equations (Linear)



Grade 5

These questions get more difficult as your go through this paper.

This topic could come up on a calculator paper and non-calculator paper.

Materials

- **Formulae Sheet** (on the next page)
- **Black** ink or ball-point pen
- Pencil
- Eraser
- Protractor
- Compass
- Tracing Paper
- **Calculator allowed**

Instructions

- Show **all** of your working.
- Draw diagrams in pencil.
- Plot graphs in pencil.
- Diagrams are **not** accurately drawn, unless otherwise indicated.

Foundation Tier Formulae Sheet

Perimeter, Area and Volume

Where *a* and *b* are the lengths of the parallel sides and *h* Is their perpendicular separation:

Area of a trapezium = ½ (a + b) h

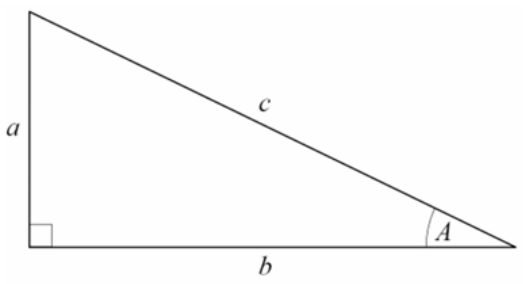
Volume of a prism = area of cross section x length

Where *r* is the radius and *d* is the diameter:

Circumference of a circle = 2πr = πd

Area of a circle = πr^2

Pythagoras' Theorem and Trigonometry



In any right-angled triangle where a, b and c are the length of the sides and c is the hypotenuse:

$$a^2 + b^2 = c^2$$

In any right-angled triangle ABC where a, b and c are the length of the sides and c is the hypotenuse:

$$\sin A = \frac{a}{c} \qquad \cos A = \frac{b}{c} \qquad \tan A = \frac{a}{b}$$

Compound Interest

Where *P* is the principal amount, *r* is the interest rate over a given period and *n* is number of times that the interest is compounded:

$$\text{Total accrued} = P\left(1 + \frac{r}{100}\right)^n$$

Probability

Where P (*A*) is the probability of outcome *A*

and P (*B*) is the probability of outcome *B*:

P (*A* or *B*) = P (*A*) + P (*B*) – P (*A* and *B*)

P (*A* and *B*) = P (*A* given *B*) P(*B*)

1 Solve the simultaneous equations.

$$5x + 2y = 26$$

$$x + 2y = 10$$

x = _____

y = _____

(Total for question 1 is 3 marks)

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2 Solve the simultaneous equations.

$$3x + 2y = 19$$

$$- 3x + 5y = -5$$

x = _____

y = _____

(Total for question 2 is 3 marks)

3 Solve the simultaneous equations.

$$x + 7y = 26$$

$$2x + 3y = 8$$

x = _____

y = _____

(Total for question 3 is 3 marks)

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4 Solve the simultaneous equations.

$$5x - 2y = 36$$

$$6x + y = 33$$

x = _____

y = _____

(Total for question 4 is 3 marks)

5 Solve the simultaneous equations.

$$3x + 5y = 35$$

$$4x - 3y = 37$$

x = _____

y = _____

(Total for question 5 is 3 marks)

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6 Solve the simultaneous equations.

$$2x - 3y = 6$$

$$7x - 8y = 11$$

x = _____

y = _____

(Total for question 6 is 3 marks)

7 Solve the simultaneous equations.

$$y = 5x - 6$$

$$y = 2x + 15$$

x = _____

y = _____

(Total for question 7 is 3 marks)

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8 Solve the simultaneous equations.

$$y = -2x + 2$$

$$y = 4x + 5$$

x = _____

y = _____

(Total for question 8 is 3 marks)

9 3 cups of tea and 2 cups of coffee cost a total of £6.55
5 cups of tea and 4 cups of coffee cost a total of £11.85
Work out the cost of one cup of coffee and one cup of tea.

Tea = £ _____

Coffee = £ _____

(Total for question 9 is 3 marks)

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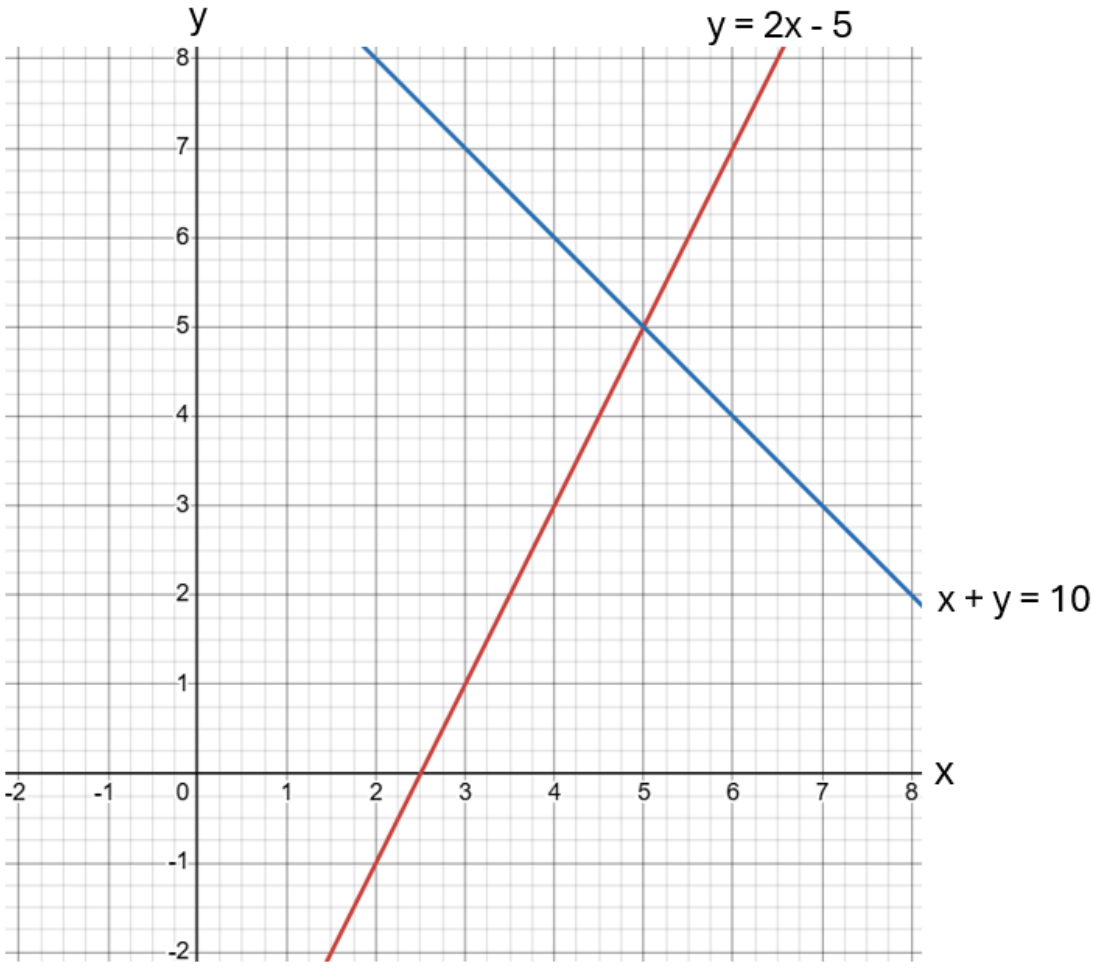
10 Doughnuts are sold in small bags and large bags.
There are a total of 66 doughnuts in 5 small bag and 3 large bags.
There are a total of 36 doughnuts in 2 small bags and 2 large bags.

Small bag = _____ doughnuts

Large bag = _____ doughnuts

(Total for question 10 is 3 marks)

11 The graphs with equations $y = 2x - 5$ and $x + y = 10$ are shown on the grid below.



Use the graphs to solve the simultaneous equations

$y = 2x - 5$

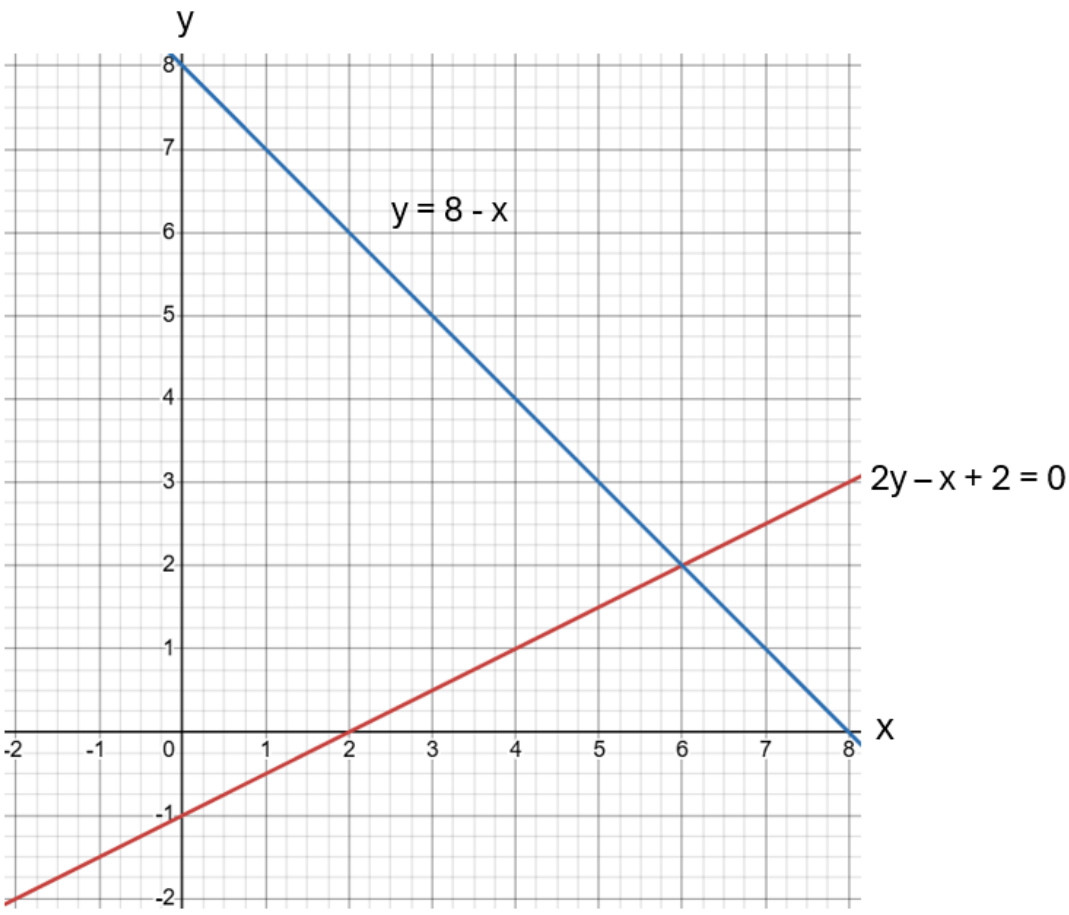
$x + y = 10$

x = _____

y = _____

(Total for question 11 is 2 marks)

12 The graphs with equations $y = 8 - x$ and $2y - x + 2 = 0$ are shown on the grid below.



Use the graphs to solve the simultaneous equations

$$y = 8 - x$$

$$2y - x + 2 = 0$$

x = _____

y = _____

(Total for question 12 is 2 marks)