

8300

GCSE MATHEMATICS

Foundation and Higher tier – Questions by Topic

Algebra

Changing the subjects of formulae with two or more steps

v1.0

Name _____

Materials

For this paper you must have:

- Mathematical instruments

Information

- The marks for questions are shown in brackets

Advice

- In all calculations, show clearly how you work out your answer

For questions 1 to 3 you must **NOT** use a calculator.



Q1.

Rearrange $c = \frac{d+2}{3}$ to make d the subject.

(Total 2 marks)

Q2.

Rearrange $x = 2y - 6$ to make y the subject.

(Total 2 marks)

Q3(H).

Rearrange $y = \frac{1}{\sqrt{x+1}}$ to make x the subject.

(Total 3 marks)

For the rest of the questions, you may use a calculator.



Q4.

Rearrange $g = 3h - 1$ to make h the subject.

(Total 2 marks)

Q5.

Rearrange $v = u + at$ to make t the subject of the formula.

(Total 2 marks)

Q6.

Rearrange $y = \frac{x}{3} + 9$ to make x the subject.

(Total 2 marks)

Q7(H).

Rearrange $2x = \frac{y}{w}$ to make w the subject.

Write down your answer from this list:

$$w = \frac{2y}{x}$$

$$w = \frac{2x}{y}$$

$$w = \frac{y}{2x}$$

$$w = \frac{x}{2y}$$

(Total 1 mark)

Q8(H).

Rearrange $y = \sqrt{\left(\frac{x}{2} + 1\right)}$ to make x the subject.

(Total 3 marks)

Q9(H).

Rearrange $a = \frac{b}{c} + 5$ to make c the subject.

(Total 3 marks)

Q10(H).

Rearrange $y = 3x - 2$ to make x the subject.

Write down your answer from this list:

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

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

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

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

(Total 1 mark)

Q11(H).

Rearrange $y = \sqrt{w^3}$ to make w the subject.

Write down your answer from this list:

$$w = y^6$$

$$w = \sqrt[3]{y^2}$$

$$w = \sqrt{y^3}$$

$$w = y^5$$

(Total 1 mark)

Changing the subjects of formulae with two or more steps– Cross-topic questions

Q12.

To travel to a festival, a group of people will hire a minibus.

This formula has all costs in £

$$\text{Cost per person} = \frac{165 + \text{cost of the minibus}}{\text{number of people in the group}}$$

- (a) With 12 people in the group, the cost of the minibus will be £567
Work out the cost per person.

(2)

- (b) With 15 people in the group, they will hire a different minibus.
The cost per person will be £50
Work out the cost of this minibus.

(3)

(Total 5 marks)

Q13.

This formula works out the tax you pay.

$$T = 0.2(E - 10\,600)$$

T is the tax you pay in pounds.

E is the amount you earn in pounds.

- (a) How much tax do you pay if you earn £20 000?

(2)

- (b) What is the most you can earn without paying tax?

(1)

- (c) Alison pays £5200 tax.

Work out the amount she earns.

(3)

(Total 6 marks)