Name		Class

🎓 MATHS TEACHER HUB

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Solving equations

(9 – 1) Topic booklet

Model answers

These questions have been collated from previous years GCSE Mathematics papers.

You must have: Ruler graduated in centimetres and millimetres, protractor, pair of compasses, pen, HB pencil, eraser.

Total Marks

Instructions

•Use **black** ink or ball-point pen.
•**Fill in the boxes** at the top of this page with your name, centre number and candidate number.
•Answer **all** questions.
•Answer the questions in the spaces provided
 – *there may be more space than you need*.
•Diagrams are NOT accurately drawn, unless otherwise indicated.
•You must **show all your working out.**
•If the question is a **1F** question you are not allowed to use a calculator.
•If the question is a **2F** or a **3F** question, you may use a calculator to help you answer.

Information

•The marks for **each** question are shown in brackets
 – *use this as a guide as to how much time to spend on each question*.

Advice

•Read each question carefully before you start to answer it.
•Keep an eye on the time.
•Try to answer every question.
•Check your answers if you have time at the end.

Answer ALL questions
Write your answers in the space provided.
You must write down all the stages in your working.

3   Solve $\dfrac{y}{4} = 10.5$

$y = 42$

$y =$ ....

(Total for Question 3 is 1 mark)

3   Solve $\dfrac{x}{5} = 2\dfrac{1}{2}$

$\dfrac{x}{5} = \dfrac{5}{2}$ $x = \dfrac{25}{2} = 12\dfrac{1}{2}$

$x =$ ....

(1)

(Total for Question 3 is 1 mark)

2

7   (a) Solve $f + 2f + f = 20$

$$4f = 20$$
$$f = 5$$

$f =$ ....

(1)

    (b) Solve $18 - m = 6$

$$m = 12$$

$m =$ ....

(1)

                                          (Total for Question 7 is 2 marks)

8   (a) Solve $m - 3 = 4$

$$m = 7$$

$m =$ ....

(1)

    (b) Solve $3n + n = 24$

$$4n = 24$$
$$n = 6$$

$n =$ ....

(2)

                                        (Total for Question 8 is 3 marks)

9
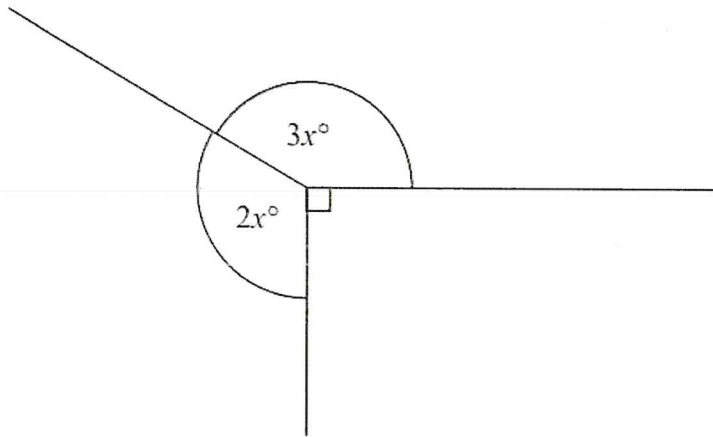
Find the value of x.

$$5x = 270°$$

$$x = \frac{270°}{5}$$

$$x = 54°$$

$$60$$

$$10x = 540$$

$$x = 54°$$

(Total for Question 9 is 3 marks)

10 (a) Solve $3m = 36$

$$m = 12$$

$m =$ ....

(1)

(b) Solve $7 - x = 3$

$$x = 4$$

$x =$ ....

(1)

(Total for Question 10 is 2 marks)

10 (a) Solve $t + t + t = 12$

$$3t = 12$$
$$t = 4$$

$t =$ ....
(1)

(b) Solve $x - 2 = 6$

$$x = 8$$

$x =$ ....
(1)

(c) Solve $6w + 2 = 20$

$$6w = 18$$
$$w = 3$$

$w =$ ....
(2)

(Total for Question 10 is 4 marks)

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10   Solve $3x + 7 = 1$

$$3x = -6$$
$$x = -2$$

$x =$ ....
(2)

(Total for Question 10 is 2 marks)

10   Solve $3x - 5 = 9$

$$3x = 14$$
$$x = \frac{14}{3}$$
$$= 4\frac{2}{3}$$

x = ...

(2)

(Total for Question 10 is 2 marks)

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11 (a) Solve $x + x + x = 51$

$$3x = 51$$
$$x = 17$$

x = ...

(1)

(b) Solve $\frac{y}{4} = 3$

$$y = 12.$$

y = ...

(1)

(c) Solve $2f + 7 = 18$

$$2f = 11$$
$$f = 5\frac{1}{2}$$

f = ...

(1)

(Total for Question 11 is 3 marks)

14 Solve $5(2m - 6) = 40$

$$10m - 30 = 40$$
$$10m = 70$$
$$m = 7$$

or

$$2m - 6 = 8$$
$$2m = 14$$
$$m = 7$$

$m = $ ....

(3)

(Total for Question 14 is 3 marks)

14 Solve $5p + 7 = 22$

$$5p = 15$$
$$p = 3$$

$p = $ ....

(2)

(Total for Question 14 is 2 marks)

15 Solve $4x - 7 = 37$

$$4x = 44$$
$$x = 11$$

$x = $ ....

(2)

(Total for Question 15 is 2 marks)

16 Here is a quadrilateral $ABCD$.
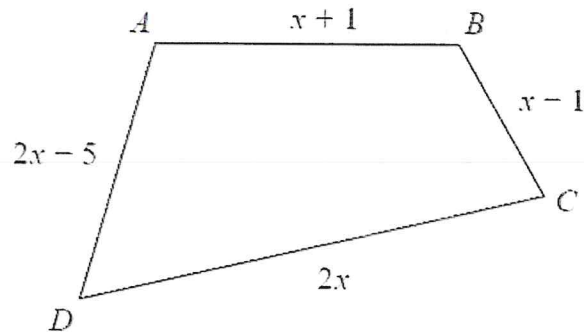
All the measurements are in centimetres.

The perimeter of $ABCD$ is 52 centimetres.

Work out the length of DC.

$$2x - 5$$
$$x + 1$$
$$2x$$
$$x - 1$$
_____
$$6x - 5 = 52$$
$$6x = 57$$
$$x = \frac{57}{6}$$
$$= 9\frac{1}{2}$$

$$DC = 2x$$
$$2 \times 9\frac{1}{2}$$
$$= 19 \, cm$$

.... centimetres

(Total for Question 16 is 4 marks)

16 Solve $3(m - 4) = 21$

$$3m - 12 = 21$$
$$3m \quad = 33$$
$$m \quad = 11$$

or

$$3(m-4) = 21$$
$$m \; \boxed{-4} = 7$$
$$m \quad = 11$$

$m = $ ....

(2)

(Total for Question 16 is 2 marks)

16 (a) Solve $4c + 5 = 11$

$$4c = 6$$
$$c = \frac{6}{4}$$
$$= 1\frac{1}{2}$$

$c = $ ....

(2)

(b) Solve $5(e + 7) = 20$

$$5x + 35 = 20$$
$$5x \quad = -15$$
$$x \quad = -3$$

or

$$5(e+7) = 20$$
$$\boxed{e + 7} = 4$$
$$e \quad = -3$$

$e = $ ....

(2)

(Total for Question 16 is 4 marks)

16 Solve $5x - 6 = 3(x - 1)$

$$5x - 6 = 3x - 3$$
$$2x - 6 = -3$$
$$2x = 3$$
$$x = 1\frac{1}{2}$$

$x =$ ....

(Total for Question 16 is 3 marks)

17 Solve $5p = 3p + 8$

$$2p = 8$$
$$p = 4$$

$p =$ ....
(2)

(Total for Question 17 is 2 marks)

17 Solve $2(5x - 4) = 21$

$$10x - 8 = 21$$
$$10x = 29$$
$$x = 2.9$$

$x =$ ....
(3)

(Total for Question 17 is 3 marks)

17 Solve $\dfrac{3y}{4} = 12$

$3y = 48$

$y = 16$

$y = \text{..}$

(2)

(Total for Question 17 is 4 marks)

17 The diagram shows a pentagon.
The pentagon has one line of symmetry.
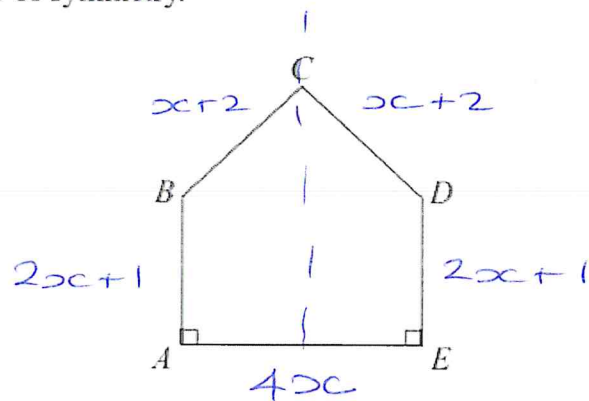
$AE = 4x$
$AB = 2x + 1$
$BC = x + 2$

All these measurements are given in centimetres.

The perimeter of the pentagon is 18 cm.

(a) Show that $10x + 6 = 18$

$$2x + 1$$
$$2x + 1$$
$$x + 2$$
$$x + 2$$
$$4x$$
$$\overline{}$$
$$10x + 6 = 18 \text{ cm}$$

(3)

(b) Find the value of x.

$$10x + 6 = 18$$
$$10x = 12$$
$$x = 1.2$$

$x =$ ....

(2)

(Total for Question 17 is 5 marks)

19 Solve $7(f-5) = 28$

$7f - 35 = 28$

$7f \qquad = 63$

$f \qquad = 9$

OR

$7(\quad) = 28$

$f - 5 = 4$

$f \qquad = 9$

$f =$ ....

(2)

May 2020 – Paper 1F

(Total for Question 19 is 2 marks)

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19 Solve $3(x-4) = 12$

$3x - 12 = 12$

$3x \qquad = 24$

$x \qquad = 8$

OR.

$3(\quad) = 12$

$x - 4 = 4$

$x = 8$

$x =$ ....

(2)

November 2018 – Paper 2F

(Total for Question 19 is 2 marks)

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19 Solve $4(x-6) = 44$

$4x - 24 = 44$

$4x \qquad = 68$

$2x \qquad = 34$

$x \qquad = 17$

$4(\quad) = 44$

$x - 6 = 11$

$x \quad = 17$

$x =$ ....

November 2019 – Paper 3F

(Total for Question 19 is 2 marks)

19   Solve $4(x - 5) = 18$

$$4x - 20 = 18$$
$$4x \quad\quad = 38$$
$$2x \quad\quad = 19$$
$$x \quad\quad = 9\tfrac{1}{2}$$

$x = $ ....

June 2017 – Paper 1F

(Total for Question 19 is 2 marks)

19 Solve $4x + 5 = x + 26$

$$3x + 5 = 26$$
$$3x \quad\quad = 21$$
$$x \quad\quad = 7$$

$x = $ ....

Sample 1 – Paper 1F

(Total for Question 19 is 2 marks)

24 Solve $2x^2 = 72$

$$x^2 = 36$$
$$x = \sqrt{36}$$
$$x = \pm 6$$

(2)

(Total for Question 24 is 2 marks)

25 Solve $\dfrac{5 - x}{2} = 2x - 7$

$$5 - x = 2(2x - 7)$$
$$5 - x = 4x - 14$$
$$5 = 5x - 14$$
$$19 = 5x$$
$$x = 3.8$$

$x = $ ....

(Total for Question 25 is 3 marks)

28 Here is a parallelogram.

(2x + 43)°

(5x − 20)°

(4y − 5x)°

equal

add to 180
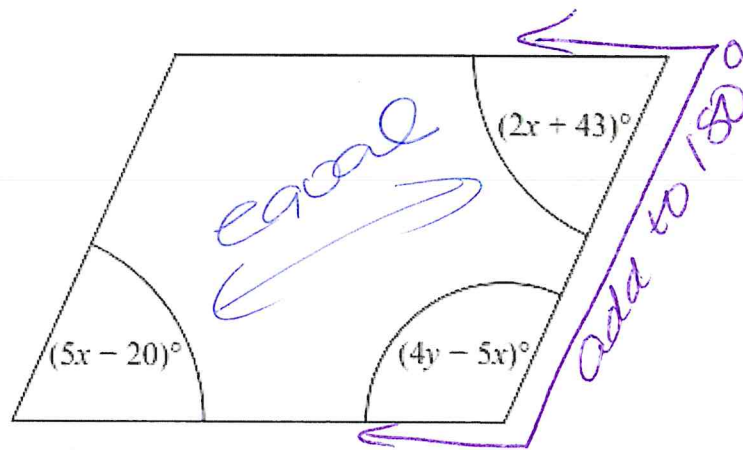
Work out the value of x and the value of y.

$$5x - 20 = 2x + 43$$
$$3x = 63$$
$$x = 21°$$

$$2x + 43$$
$$= 42 + 43$$
$$= 85°$$

$$4y - 5x = 95$$
$$4y - 105 = 95$$
$$4y = 200$$
$$y = 50°$$

x = ...

y = ...

(Total for Question 28 is 5 marks)