2.2 Algebra: Equations: 1-hour Pack

Calculator allowed · about 60 minutes

Name: _____ Date: ____ / ____ / _____

Answer ALL questions. Show all your working.

1 Solve the equation 7 - x = 3.

(1)

2 Solve the equation 3x - 7 = 11.

(2)

3 Solve the equation x + 7 = 12.

(1)

4 Solve the equation x - 4 = 9.

(1)

5 Solve the equation 3x = 21.

(1)

6 Solve the equation x / 4 = 6.

(1)

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7 Solve each equation. Expand the bracket first.

(a) $3(x + 2) = 21$ **(2)**

.....

(b) $4(2x - 1) = 28$ **(2)**

.....

8 Solve each equation involving a fraction.

(a) $x/3 + 5 = 9$ **(2)**

.....

(b) $x/5 - 2 = 3$ **(2)**

.....

9 Solve the equation $5x + 8 = -7$.

(2)

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10 Solve each equation. The unknown appears on both sides.

(a) $5x + 3 = 2x + 18$ **(3)**

(b) $7x - 4 = 3x + 20$ **(3)**

11 Solve the equation $2(x + 3) = 16$.

(2)

12 Solve the equation $2x = -10$.

(1)

13 Solve the equation $x - 6 = -2$.

(1)

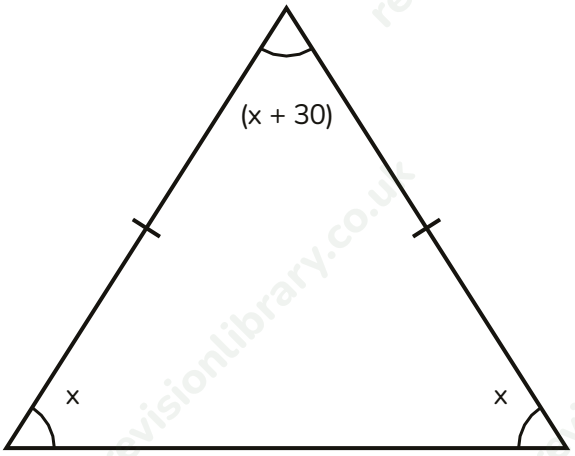
14 Solve the equation $7 - x = 3$.

(1)

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15 An isosceles triangle has two equal base angles of x degrees each. The apex angle is (x + 30) degrees.

Diagram NOT accurately drawn



(a) Form an equation in x, using the fact that angles in a triangle sum to 180 degrees. **(1)**

(b) Solve your equation to find x. **(2)**

.....

(c) Find the size of the apex angle. **(1)**

.....

16 Solve the equation 5x - 4 = 2x + 11.

(3)

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17 Solve (2p - 6)/2 = 6

(3)

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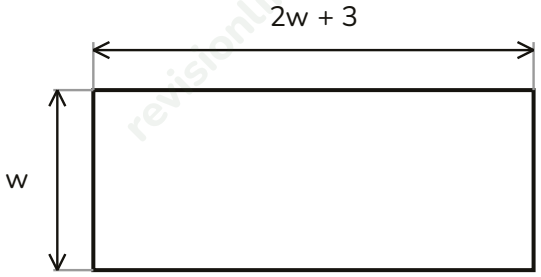
18 I think of a number, multiply it by 5 and add 3. The answer is 38. Form an equation and solve it to find my number.

(3)

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19 The length of a rectangle is 3 cm more than twice its width, w. The perimeter of the rectangle is 54 cm.

Diagram NOT accurately drawn



(a) Write an expression for the length in terms of w. **(1)**

(b) Form an equation in w for the perimeter. **(1)**

(c) Solve your equation to find w. **(2)**

(d) Calculate the area of the rectangle. **(1)**

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Mark scheme · 2.2 Algebra: Equations: 1-hour Pack

Question 1

x = 4 (cao) **B1**

Answer: **x = 4**

Question 2

3x = 18 oe **M1**

x = 6 (cao) **A1**

Answer: **x = 6**

Question 3

x = 5 cao **B1**

Answer: **x = 5**

Question 4

x = 13 cao **B1**

Answer: **x = 13**

Question 5

x = 7 cao **B1**

Answer: **x = 7**

Question 6

x = 24 cao **B1**

Answer: **x = 24**

Question 7

(a) correct expansion, 3x + 6 = 21 oe **M1**

(a) x = 5 (cao) **A1**

(a) Answer: **x = 5**

(b) correct expansion, 8x - 4 = 28 oe **M1**

(b) x = 4 (cao) **A1**

(b) Answer: **x = 4**

Question 8

(a) x/3 = 4 oe **M1**

(a) x = 12 (cao) **A1**

(a) Answer: **x = 12**

(b) x/5 = 5 oe **M1**

(b) x = 25 (cao) **A1**

(b) Answer: **x = 25**

Question 9

5x = -15 oe **M1**

x = -3 (cao) **A1**

Answer: **x = -3**

Question 10

(a) collects x terms on one side, 3x + 3 = 18 oe **M1**

(a) collects constants, 3x = 15 oe **dM1**

(a) x = 5 (cao) **A1**

(a) Answer: **x = 5**

(b) collects x terms on one side, 4x - 4 = 20 oe **M1**

(b) collects constants, 4x = 24 oe **dM1**

(b) x = 6 (cao) **A1**

(b) Answer: **x = 6**

Question 11

2x + 6 = 16 oe, or x + 3 = 8 **M1**

x = 5 (cao) **A1**

Answer: **x = 5**

Question 12

x = -5 cao **B1**

Answer: **x = -5**

Question 13

x = 4 cao **B1**

Answer: **x = 4**

Question 14

x = 4 cao **B1**

Answer: **x = 4**

Question 15

(a) x + x + (x + 30) = 180 oe **B1**

(a) Answer: **x + x + (x + 30) = 180**

(b) 3x + 30 = 180 => 3x = 150 oe **M1**

(b) x = 50 (cao) **A1**

(b) Answer: **x = 50**

(c) 80 degrees (ft their x + 30) **B1**

(c) Answer: **80 degrees**

Question 16

collects x terms on one side, e.g. 3x - 4 = 11 **M1**

correct further rearrangement, e.g. 3x = 15 **M1**

x = 5 cao **A1**

Answer: **x = 5**

Question 17

multiplies both sides by the denominator **M1**

correct second step **M1**

p = 9 cao **A1**

Answer: **p = 9**

Question 18

5n + 3 = 38 (or equivalent equation) **M1**

correct method to solve **M1**

7 cao **A1**

Answer: **7**

Question 19

(a) 2w + 3 **B1**

(a) Answer: **2w + 3**

(b) 2(w + 2w + 3) = 54 oe, e.g. 6w + 6 = 54 **B1**

(b) Answer: **2(w + 2w + 3) = 54**

(c) 6w = 48 oe **M1**

(c) w = 8 (cao) **A1**

(c) Answer: **w = 8**

(d) 152 cm² (ft their w, length = 2w+3 = 19, area = 8 x 19) **B1**

(d) Answer: **152 cm^2**

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