2.11 Equations with Brackets and Unknowns on Both Sides: Test Pack

Calculators not allowed · about 60 minutes

Name: _____ Date: ____ / ____ / _____

Answer ALL questions. Show all your working.

1 Solve $2(x + 3) = 14$

(2)

2 Five boxes each contain $(x + 2)$ stickers. Altogether there are 65 stickers. Form an equation and solve for x.

(3)

3 Solve $(3/4)x + 2 = 11$

(3)

4 Kwame is 3 less than twice Erin. Their ages add to 33. Write equations to represent this and find their ages.

(4)

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5 Solve $4(x + 1) - (x - 2) = 2x + 9$

(3)

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6 Solve $2(x + 3) = 2x + 6$. State whether there is a unique solution, no solution or infinitely many solutions and explain briefly.

(3)

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7 Solve $6(x - 5) + 2 = -22$

(3)

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8 Solve $7b + 11 = 5b + 19$

(3)

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9 A rectangle has length (x + 2) cm and width 5 cm. Its area is 35 cm². Form an equation and find x.

Diagram NOT accurately drawn



35 cm²

(3)

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10 Solve 4(m + 8) + 7 = 63

(3)

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11 Solve 9a + 5 = 2a - 9

(3)

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12 Solve x/2 + 3 = 11

(2)

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13 Deshi has x boxes of cards. Each box contains 6 cards and he also has 7 loose cards. Altogether he has 43 cards. Form an equation and solve it for x.

(3)

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14 A cinema charges the same amount, x pounds, per ticket. Takings for 3(x + 4) tickets on Monday equalled takings of 4x tickets on Tuesday, minus £10. Form and simplify an equation, then solve it. (Start from 3(x + 4) = 4x - 10.)

(3)

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15 Five equal boxes each contain x stickers, and there are 9 extra stickers. Altogether there are 79 stickers. Form an equation and solve it for x. Show your check.

(4)

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16 Solve 5(x + 2) = 2x + 20.

(2)

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Mark scheme · 2.11 Equations with Brackets and Unknowns on Both Sides: Test Pack

Question 1

expand the bracket or divide both sides by 2 after simplifying: 2x + 6 = 14 or x + 3 = 7	M1
x = 4 cao	A1

Answer: **4**

Question 2

correct formation: 5(x + 2) = 65	M1
expand or divide then solve: x + 2 = 13 or 5x + 10 = 65	M1
x = 11 cao	A1

Answer: **11**

Question 3

subtract 2 then multiply by 4/3: (3/4)x = 9	M1
x = 9 * (4/3) or x = 12	M1
x = 12 cao	A1

Answer: **12**

Question 4

correct first equation: K = 2E - 3 or equivalent	M1
correct sum equation substituting K: (2E - 3) + E = 33 or 3E - 3 = 33	M1
E = 12 cao	A1
K = 21 cao	A1

Answer: **Erin = 12, Kwame = 21**

Question 5

expand and remove brackets: 4x + 4 - x + 2 = 2x + 9 giving 3x + 6 = 2x + 9	M1
collect x terms to give x = 3	M1
x = 3 cao	A1

Answer: **3**

Question 6

expand both sides or simplify to show 2x + 6 = 2x + 6	M1
recognise that the variable terms cancel giving a true statement 6 = 6	M1
infinitely many solutions cao (any x satisfies the equation)	A1

Answer: **Infinitely many solutions**

Question 7

expands the bracket: 6x - 30	M1
collects number terms and isolates the term in the letter	M1
x = 1 cao	A1

Answer: **x = 1**

Question 8

collects the letter terms on one side: 2b	M1
collects number terms on the other side	M1
b = 4 cao	A1

Answer: **b = 4**

Question 9

5(x + 2) = 35	M1
correct method to solve	M1
x = 5 cao	A1

Answer: **x = 5**

Question 10

expands the bracket: 4m + 32	M1
collects number terms and isolates the term in the letter	M1
m = 6 cao	A1

Answer: **m = 6**

Question 11

collects the letter terms on one side: 7a	M1
collects number terms on the other side	M1
a = -2 cao	A1

Answer: **a = -2**

Question 12

subtract 3 then multiply by 2: x/2 = 8	M1
x = 16 cao	A1

Answer: **16**

Question 13

forms 6x + 7 = 43	M1
correct rearrangement, e.g. 6x = 36	M1
x = 6 cao	A1

Answer: **x = 6**

Question 14

expands bracket: 3x + 12 = 4x - 10	M1
correct rearrangement, e.g. 22 = x	M1
x = 22 cao	A1

Answer: **x = 22**

Question 15

forms 5x + 9 = 79	M1
correct rearrangement, e.g. 5x = 70	M1
x = 14 cao	A1
check shown: 5(14) + 9 = 79	B1

Answer: **x = 14**

Question 16

expands bracket: 5x + 10 = 2x + 20	M1
x = 10/3 cao	A1

Answer: **x = 10/3**

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