2.9 Factorising into Single Brackets: Test Pack

Calculators not allowed · about 55 minutes

Name: _____ Date: ____ / ____ / _____

Answer ALL questions. Show all your working.

1 Write down the greatest common factor for each pair of numbers.

(a) GCF of 18 and 30 **(1)**

.....

(b) GCF of 14 and 35 **(1)**

.....

(c) GCF of 24 and 40 **(1)**

.....

2 Apply factorising to simplify an expression used in a context.

(a) A recipe needs 12ab + 6b grams of an ingredient. Factorise to write the amount as a product. **(3)**

3 Solve each equation by factorising. Show your steps.

(a) Solve 6x - 18 = 0 **(4)**

.....

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4 A school buys 18 identical packs and 24 identical rulers. The total cost is 18p + 24r. Factorise the total cost to show the cost of one set containing a pack and a ruler.

(a) Write the total cost 18p + 24r as a product showing the cost of one pack and one ruler. **(3)**

5 Stretch: Factorise fully and then indicate whether the bracket contains only positive terms. Explain how you know.

(a) Factorise -12k + 8 - 16k and say whether the bracket has only positive terms. **(3)**

6 Factorise fully $5p^2 - 7p$.

(2)

7 Factorise fully 24ny - 30n.

(2)

8 (a) Factorise 10b + 8.
(b) Use your answer to (a) to work out the value of 10b + 8 when b = 9.

(3)

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9 (a) Factorise 15x + 24.
(b) Use your answer to (a) to work out the value of 15x + 24 when x = 3.

(3)

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10 Factorise each expression and then check by expanding your answer.

(a) Factorise 16x + 24 and expand your factorised form to check **(3)**

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11 Factorise fully 1.2x + 3.6.

(2)

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12 Factorise 5x - 20 completely, then use your factorised form to solve the equation 5x - 20 = 0.

(3)

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13 A rectangle has area 24x + 36 square cm, where the width is a whole number of cm common to both terms and is as large as possible.

Diagram NOT accurately drawn



24x + 36 square cm

(a) Factorise 24x + 36 fully to find the greatest possible width and the length of the rectangle. **(2)**

(b) Given that x = 3, work out the width and the length of the rectangle. **(2)**

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14 The area of a path is given by the expression $9x^2 - 6x$, where x is a length in metres.

(a) Factorise $9x^2 - 6x$ fully. **(2)**

(b) Given that the path is 3x metres wide, write down an expression for its length, using your factorised form. **(1)**

.....

(c) Given that x = 5, work out the area of the path in square metres. **(2)**

.....

15 Factorise 9y - 15.

(1)

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Mark scheme · 2.9 Factorising into Single Brackets: Test Pack

Question 1

(a) 6 cao **B1**

(a) Answer: **6**

(b) 7 cao **B1**

(b) Answer: **7**

(c) 8 cao **B1**

(c) Answer: **8**

Question 2

(a) identify common factor 6b **M1**

(a) write factorised form 6b(2a + 1) **M1**

(a) final answer 6b(2a + 1) cao **A1**

(a) Answer: **6b(2a + 1)**

Question 3

(a) factor out 6 to give 6(x - 3) = 0 **M1**

(a) use zero product principle or divide both sides by 6 **M1**

(a) isolate x showing x - 3 = 0 **M1**

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

(a) Answer: **3**

Question 4

(a) identify common factor 6 **M1**

(a) write 6(3p + 4r) **M1**

(a) 6(3p + 4r) cao **A1**

(a) Answer: **6(3p + 4r)**

Question 5

(a) correct factor taken out, e.g. -4 **M1**

(a) correct factorised form -4(3k - 2 + 4k) or simplified -4(7k - 2) **M1**

(a) state that the bracket 7k - 2 is not all positive for small k and explain oe **A1**

(a) Answer: **-4(7k - 2)**

Question 6

a correct common factor taken out (partial factorisation) **M1**

p(5p - 7) cao **A1**

Answer: **p(5p - 7)**

Question 7

a correct common factor taken out (partial factorisation) **M1**

6n(4y - 5) cao **A1**

Answer: **6n(4y - 5)**

Question 8

a correct common factor taken out **M1**

(a) 2(5b + 4) **A1**

(b) 98 **A1**

Answer: **(a) 2(5b + 4), (b) 98**

Question 9

a correct common factor taken out **M1**

(a) 3(5x + 8) **A1**

(b) 69 **A1**

Answer: **(a) 3(5x + 8), (b) 69**

Question 10

(a) factor method, take out 8 **M1**

(a) correct factorised form 8(2x + 3) **M1**

(a) expansion 16x + 24 cao **A1**

(a) Answer: **8(2x + 3)**

Question 11

identify GCF 1.2 **M1**

1.2(x + 3) cao **A1**

Answer: **1.2(x + 3)**

Question 12

factorise to 5(x - 4) **M1**

use zero product, x - 4 = 0 **M1**

x = 4 cao **A1**

Answer: **5(x - 4); x = 4**

Question 13

(a) identify GCF 12 **M1**

(a) 12(2x + 3) cao **A1**

(a) Answer: **12(2x + 3)**

(b) substitute x = 3 into (2x + 3) to get the length **M1**

(b) width 12 cm, length 9 cm cao **A1**

(b) Answer: **width 12 cm, length 9 cm**

Question 14

(a) identify GCF 3x **M1**

(a) 3x(3x - 2) cao **A1**

(a) Answer: **3x(3x - 2)**

(b) (3x - 2) metres cao **B1**

(b) Answer: **(3x - 2) metres**

(c) substitute x = 5 into $9x^2$ - 6x or into 3x(3x-2) **M1**

(c) 195 cao **A1**

(c) Answer: **195 square metres**

Question 15

3(3y - 5) cao **B1**

Answer: **3(3y - 5)**

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