2.9 Factorising into Single Brackets: 2-hour Pack

Calculators not allowed · about 120 minutes

Name: _____ Date: ____ / ____ / _____

Answer ALL questions. Show all your working.

1 (a) Factorise 56a + 63.
(b) Use your answer to (a) to work out the value of 56a + 63 when a = 7.

(3)

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2 Factorise fully $3t^2 - 8t$.

(2)

---

3 Factorise fully $25t^2 + 20t$.

(2)

---

4 Factorise fully 35nz - 25n.

(2)

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5 Factorise fully 4b - 2.

(2)

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6 (a) Factorise 18a + 24.
(b) Use your answer to (a) to work out the value of 18a + 24 when a = 4.

(3)

---

7 Factorise each expression fully, taking out common algebraic factors.

(a) Factorise $12x^2 + 18x$ **(1)**

(b) Factorise $7x - 21x^2$ **(1)**

(c) Factorise $15y^2 - 10y$ **(1)**

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8 Factorise fully 10t - 2.

(2)

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9 (a) Factorise 8x + 14.
(b) Use your answer to (a) to work out the value of 8x + 14 when x = 11.

(3)

---

10 Factorise fully 63b - 9.

(2)

---

11 (a) Factorise 15x + 3.
(b) Use your answer to (a) to work out the value of 15x + 3 when x = 7.

(3)

---

12 Factorise fully $25a^2 + 15a$.

(2)

---

13 (a) Factorise 30n + 5.
(b) Use your answer to (a) to work out the value of 30n + 5 when n = 15.

(3)

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14 (a) Factorise 36b + 42.
(b) Use your answer to (a) to work out the value of 36b + 42 when b = 4.

(3)

---

15 (a) Factorise 12a + 14.
(b) Use your answer to (a) to work out the value of 12a + 14 when a = 5.

(3)

---

16 (a) Factorise 24a + 4.
(b) Use your answer to (a) to work out the value of 24a + 4 when a = 8.

(3)

---

17 Factorise each expression where one term is negative.

(a) Factorise -6x + 18 **(1)**

(b) Factorise 8 - 12p **(1)**

---

18 Factorise fully $9a^2 - 6a$.

(2)

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19 (a) Factorise 7x + 7.
(b) Use your answer to (a) to work out the value of 7x + 7 when x = 13.

(3)

---

20 (a) Factorise 16b + 36.
(b) Use your answer to (a) to work out the value of 16b + 36 when b = 4.

(3)

---

21 (a) Factorise 42n + 12.
(b) Use your answer to (a) to work out the value of 42n + 12 when n = 13.

(3)

---

22 (a) Factorise 56x + 40.
(b) Use your answer to (a) to work out the value of 56x + 40 when x = 9.

(3)

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23 (a) Factorise 45a + 63.
(b) Use your answer to (a) to work out the value of 45a + 63 when a = 15.

(3)

---

24 (a) Factorise 2a + 16.
(b) Use your answer to (a) to work out the value of 2a + 16 when a = 6.

(3)

---

25 Factorise fully 27pk + 45p.

(2)

---

26 Factorise fully 6ny - 36n.

(2)

---

27 Factorise each expression completely. Show any common algebraic factors taken out.

(a) Factorise $18x^2 - 24x$ **(2)**

(b) Factorise 14ab - 21a **(2)**

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28 Factorise each expression where every term has a number and a letter in common.

(a) Factorise 21mn + 14m **(1)**

(b) Factorise 30xy - 10y **(1)**

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29 Factorise 8x + 12.

(1)

---

30 Factorise fully -14x + 21.

(2)

---

31 Factorise fully 24mn - 16m.

(2)

---

32 Factorise fully $15x^2 + 25x$.

(2)

---

33 Factorise fully $12x^2y - 18xy + 6xy^2$.

(3)

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34 A market stall sells 16 apples and 24 pears for a total of (16p + 24q) pounds, where p is the price of an apple and q is the price of a pear. Factorise the total to show the cost of one bundle containing a fixed number of apples and pears.

(3)

---

35 Factorise 7a + 7b.

(1)

---

36 Factorise $x^2 + 9x$.

(1)

---

37 Factorise 10p - 25.

(1)

---

38 Factorise $6m^2 - 8m$.

(1)

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39 Factorise 16xy + 12x.

(1)

40 Factorise fully 20x + 30y + 10.

(2)

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Mark scheme · 2.9 Factorising into Single Brackets: 2-hour Pack

Question 1

a correct common factor taken out	M1
(a) 7(8a + 9)	A1
(b) 455	A1

Answer: **(a) 7(8a + 9), (b) 455**

Question 2

a correct common factor taken out (partial factorisation)	M1
t(3t - 8) cao	A1

Answer: **t(3t - 8)**

Question 3

a correct common factor taken out (partial factorisation)	M1
5t(5t + 4) cao	A1

Answer: **5t(5t + 4)**

Question 4

a correct common factor taken out (partial factorisation)	M1
5n(7z - 5) cao	A1

Answer: **5n(7z - 5)**

Question 5

a correct common factor taken out (partial factorisation)	M1
2(2b - 1) cao	A1

Answer: **2(2b - 1)**

Question 6

a correct common factor taken out	M1
(a) 6(3a + 4)	A1
(b) 96	A1

Answer: **(a) 6(3a + 4), (b) 96**

Question 7

(a) 6x(2x + 3) cao	B1
(a) Answer: **6x(2x + 3)**	
(b) 7x(1 - 3x) oe	B1
(b) Answer: **7x(1 - 3x)**	
(c) 5y(3y - 2) cao	B1
(c) Answer: **5y(3y - 2)**	

Question 8

a correct common factor taken out (partial factorisation)	M1
2(5t - 1) cao	A1

Answer: **2(5t - 1)**

Question 9

a correct common factor taken out	M1
(a) 2(4x + 7)	A1
(b) 102	A1

Answer: **(a) 2(4x + 7), (b) 102**

Question 10

a correct common factor taken out (partial factorisation)	M1
9(7b - 1) cao	A1

Answer: **9(7b - 1)**

Question 11

a correct common factor taken out	M1
(a) 3(5x + 1)	A1
(b) 108	A1

Answer: **(a) 3(5x + 1), (b) 108**

Question 12

a correct common factor taken out (partial factorisation)	M1
5a(5a + 3) cao	A1

Answer: **5a(5a + 3)**

Question 13

a correct common factor taken out	M1
(a) 5(6n + 1)	A1
(b) 455	A1

Answer: **(a) 5(6n + 1), (b) 455**

Question 14

a correct common factor taken out	M1
(a) 6(6b + 7)	A1
(b) 186	A1

Answer: **(a) 6(6b + 7), (b) 186**

Question 15

a correct common factor taken out	M1
(a) 2(6a + 7)	A1
(b) 74	A1

Answer: **(a) 2(6a + 7), (b) 74**

Question 16

a correct common factor taken out	M1
(a) 4(6a + 1)	A1
(b) 196	A1

Answer: **(a) 4(6a + 1), (b) 196**

Question 17

(a) -6(x - 3) or 6(-x + 3) oe	B1
(a) Answer: **-6(x - 3)**	
(b) 4(2 - 3p) cao	B1
(b) Answer: **4(2 - 3p)**	

Question 18

a correct common factor taken out (partial factorisation)	M1
3a(3a - 2) cao	A1

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

Question 19

a correct common factor taken out	M1
(a) 7(x + 1)	A1
(b) 98	A1

Answer: **(a) 7(x + 1), (b) 98**

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Question 20

a correct common factor taken out **M1**
(a) 4(4b + 9) **A1**
(b) 100 **A1**
Answer: **(a) 4(4b + 9), (b) 100**

Question 21

a correct common factor taken out **M1**
(a) 6(7n + 2) **A1**
(b) 558 **A1**
Answer: **(a) 6(7n + 2), (b) 558**

Question 22

a correct common factor taken out **M1**
(a) 8(7x + 5) **A1**
(b) 544 **A1**
Answer: **(a) 8(7x + 5), (b) 544**

Question 23

a correct common factor taken out **M1**
(a) 9(5a + 7) **A1**
(b) 738 **A1**
Answer: **(a) 9(5a + 7), (b) 738**

Question 24

a correct common factor taken out **M1**
(a) 2(a + 8) **A1**
(b) 28 **A1**
Answer: **(a) 2(a + 8), (b) 28**

Question 25

a correct common factor taken out (partial factorisation) **M1**
9p(3k + 5) cao **A1**
Answer: **9p(3k + 5)**

Question 26

a correct common factor taken out (partial factorisation) **M1**
6n(y - 6) cao **A1**
Answer: **6n(y - 6)**

Question 27

(a) method: factor common number and x, e.g. 6x taken out **M1**
(a) 6x(3x - 4) cao **A1**
(a) Answer: **6x(3x - 4)**
(b) method: take out 7a **M1**
(b) 7a(2b - 3) cao **A1**
(b) Answer: **7a(2b - 3)**

Question 28

(a) 7m(3n + 2) cao **B1**
(a) Answer: **7m(3n + 2)**
(b) 10y(3x - 1) cao **B1**
(b) Answer: **10y(3x - 1)**

Question 29

4(2x + 3) cao **B1**
Answer: **4(2x + 3)**

Question 30

identify GCF 7 and take it out with correct signs **M1**
-7(2x - 3) cao **A1**
Answer: **-7(2x - 3)**

Question 31

identify GCF 8m **M1**
8m(3n - 2) cao **A1**
Answer: **8m(3n - 2)**

Question 32

identify GCF 5x **M1**
5x(3x + 5) cao **A1**
Answer: **5x(3x + 5)**

Question 33

identify GCF 6xy **M1**
divide each term correctly by 6xy **M1**
6xy(2x - 3 + y) cao **A1**
Answer: **6xy(2x - 3 + y)**

Question 34

identify common factor 8 **M1**
write 8(2p + 3q) **M1**
8(2p + 3q) cao **A1**
Answer: **8(2p + 3q)**

Question 35

7(a + b) cao **B1**
Answer: **7(a + b)**

Question 36

x(x + 9) cao **B1**
Answer: **x(x + 9)**

Question 37

5(2p - 5) cao **B1**
Answer: **5(2p - 5)**

Question 38

2m(3m - 4) cao **B1**
Answer: **2m(3m - 4)**

Question 39

4x(4y + 3) cao **B1**
Answer: **4x(4y + 3)**

Question 40

identify GCF 10 **M1**
10(2x + 3y + 1) cao **A1**
Answer: **10(2x + 3y + 1)**

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