2.13 Expanding Double Brackets: 2-hour Pack

Calculators not allowed · about 120 minutes

Name: _____ Date: ____ / ____ / _____

Answer ALL questions. Show all your working.

1 Expand and simplify $5(n + 4) - 6(n - 2)$.

(3)

2 Show that $3(b + 7) + 3(b + 5) = 6b + 36$.

(3)

3 Expand and simplify $(t - 1)^2$.

(3)

4 Show that $t^2 + 13t + 40$ can be written as $(t + 5)(t + 8)$.

(3)

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5 Expand and simplify $(n - 4)^2$.

(3)

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6 Expand and simplify $(t + 1)^2$.

(3)

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7 Show that $3(n + 1) + 6(n + 5) = 9n + 33$.

(3)

---

8 Show that $6(a + 2) + 3(a + 7) = 9a + 33$.

(3)

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9 Show that $4(n + 3) + 6(n + 5) = 10n + 42$.

(3)

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10 Expand and simplify: $(3x - 2)^2$.

(3)

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11 Show that $t^2 + 12t + 35$ can be written as $(t + 5)(t + 7)$.

(3)

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12 Show that $6(a + 7) + 6(a + 4) = 12a + 66$.

(3)

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13 Show that $6(b + 3) + 4(b + 7) = 10b + 46$.

(3)

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14 Show that $x^2 + 14x + 49$ can be written as $(x + 7)(x + 7)$.

(3)

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15 Expand and simplify $(p + 4)(p - 2)$.

(3)

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16 Show that $n^2 + 6n + 5$ can be written as $(n + 1)(n + 5)$.

(3)

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17 Show that $n^2 + 7n + 6$ can be written as $(n + 1)(n + 6)$.

(3)

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18 Expand and simplify $(n - 9)^2$.

(3)

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19 Expand and simplify $6(n + 6) + 4(n - 8)$.

(3)

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20 Expand and simplify: $(x + 4)(2x + 5)$.

(4)

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21 Expand and simplify: $(4x + 1)(x - 2)$.

(3)

---

22 Expand and simplify: $(x + 2)(x^2 + x + 3)$. Note: multiply a binomial by a trinomial.

(4)

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23 Expand each pair of brackets. Write your answer in fully simplified form.

(a) Expand $(x + 2)(x + 7)$. **(1)**

(b) Expand $(3x - 1)(x + 5)$. **(1)**

(c) Expand $(x - 4)(x - 3)$. **(1)**

(d) Expand $(2x + 5)(x - 2)$. **(1)**

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24 Expand $(x - 2)(x - 3)$.

(1)

---

25 Expand and simplify: $(x + 3)(x^2 + 2x + 4)$. Note: multiply a binomial by a trinomial.

(3)

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26 Expand and simplify: $(3x - 1)(x^2 + 3x - 2)$.

(3)

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27 Expand and simplify then collect like terms: $(x + 5)(x - 4) + (x - 2)(x + 6)$.

(3)

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28 Expand $(x + 1)(x + 2)$.

(1)

---

29 Expand $(x + 4)(x - 1)$.

(1)

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30 Expand and simplify: $(3x + 2)(3x - 2)$.

(2)

---

31 Square the binomial and simplify: $(x + 9)^2$.

(2)

---

32 Expand and simplify: $(2x - 5)^2$.

(2)

---

33 Expand and simplify: $(x + 3)(2x + 7)$.

(2)

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Mark scheme · 2.13 Expanding Double Brackets: 2-hour Pack

Question 1

first bracket expanded correctly	M1
second bracket expanded correctly (watch the signs)	M1
-n + 32 cao	A1

Answer: **-n + 32**

Question 2

3(b + 7) = 3b + 21	M1
3(b + 5) = 3b + 15	M1
collects like terms to give 6b + 36	A1

Answer: **6b + 36 (shown)**

Question 3

at least three of the four products correct	M1
all four products correct	M1
t^2 - 2t + 1 cao	A1

Answer: **t^2 - 2t + 1**

Question 4

expands (t + 5)(t + 8) with at least three terms correct	M1
t^2 + 5t + 8t + 40 shown	M1
t^2 + 13t + 40 shown (with 5t + 8t = 13t)	A1

Answer: **t^2 + 13t + 40 (shown)**

Question 5

at least three of the four products correct	M1
all four products correct	M1
n^2 - 8n + 16 cao	A1

Answer: **n^2 - 8n + 16**

Question 6

at least three of the four products correct	M1
all four products correct	M1
t^2 + 2t + 1 cao	A1

Answer: **t^2 + 2t + 1**

Question 7

3(n + 1) = 3n + 3	M1
6(n + 5) = 6n + 30	M1
collects like terms to give 9n + 33	A1

Answer: **9n + 33 (shown)**

Question 8

6(a + 2) = 6a + 12	M1
3(a + 7) = 3a + 21	M1
collects like terms to give 9a + 33	A1

Answer: **9a + 33 (shown)**

Question 9

4(n + 3) = 4n + 12	M1
6(n + 5) = 6n + 30	M1
collects like terms to give 10n + 42	A1

Answer: **10n + 42 (shown)**

Question 10

method: (3x - 2)(3x - 2) or use a^2 - 2ab + b^2	M1
middle term found correctly	M1
$9x^2$ - 12x + 4 cao	A1

Answer: **$9x^2$ - 12x + 4**

Question 11

expands (t + 5)(t + 7) with at least three terms correct	M1
t^2 + 5t + 7t + 35 shown	M1
t^2 + 12t + 35 shown (with 5t + 7t = 12t)	A1

Answer: **t^2 + 12t + 35 (shown)**

Question 12

6(a + 7) = 6a + 42	M1
6(a + 4) = 6a + 24	M1
collects like terms to give 12a + 66	A1

Answer: **12a + 66 (shown)**

Question 13

6(b + 3) = 6b + 18	M1
4(b + 7) = 4b + 28	M1
collects like terms to give 10b + 46	A1

Answer: **10b + 46 (shown)**

Question 14

expands (x + 7)(x + 7) with at least three terms correct	M1
x^2 + 7x + 7x + 49 shown	M1
x^2 + 14x + 49 shown (with 7x + 7x = 14x)	A1

Answer: **x^2 + 14x + 49 (shown)**

Question 15

at least three of the four products correct	M1
all four products correct	M1
p^2 + 2p - 8 cao	A1

Answer: **p^2 + 2p - 8**

Question 16

expands (n + 1)(n + 5) with at least three terms correct	M1
n^2 + n + 5n + 5 shown	M1
n^2 + 6n + 5 shown (with n + 5n = 6n)	A1

Answer: **n^2 + 6n + 5 (shown)**

Question 17

expands (n + 1)(n + 6) with at least three terms correct	M1
n^2 + n + 6n + 6 shown	M1
n^2 + 7n + 6 shown (with n + 6n = 7n)	A1

Answer: **n^2 + 7n + 6 (shown)**

Question 18

at least three of the four products correct	M1
all four products correct	M1
n^2 - 18n + 81 cao	A1

Answer: **n^2 - 18n + 81**

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Question 19

first bracket expanded correctly	M1
second bracket expanded correctly (watch the signs)	M1
10n + 4 cao	A1

Answer: **10n + 4**

Question 20

first and outer/inner/last products attempted correctly	M1
all four terms written	M1
like terms combined correctly	M1
$2x^2 + 13x + 20$ cao	A1

Answer: **$2x^2 + 13x + 20$**

Question 21

multiplications shown correctly	M1
like terms combined	M1
$4x^2 - 7x - 2$ cao	A1

Answer: **$4x^2 - 7x - 2$**

Question 22

x multiplied by each term of the trinomial or equivalent	M1
2 multiplied by each term of the trinomial or equivalent	M1
all terms collected	M1
$x^3 + 3x^2 + 5x + 6$ cao	A1

Answer: **$x^3 + 3x^2 + 5x + 6$**

Question 23

(a) $x^2 + 9x + 14$ cao	B1

(a) Answer: **$x^2 + 9x + 14$**

(b) $3x^2 + 14x - 5$ cao	B1

(b) Answer: **$3x^2 + 14x - 5$**

(c) $x^2 - 7x + 12$ cao	B1

(c) Answer: **$x^2 - 7x + 12$**

(d) $2x^2 + x - 10$ cao	B1

(d) Answer: **$2x^2 + x - 10$**

Question 24

$x^2 - 5x + 6$ cao	B1

Answer: **$x^2 - 5x + 6$**

Question 25

multiplies the trinomial by x correctly	M1
multiplies the trinomial by 3 correctly	M1
$x^3 + 5x^2 + 10x + 12$ cao	A1

Answer: **$x^3 + 5x^2 + 10x + 12$**

Question 26

multiplies the trinomial by 3x correctly	M1
multiplies the trinomial by -1 correctly	M1
$3x^3 + 8x^2 - 9x + 2$ cao	A1

Answer: **$3x^3 + 8x^2 - 9x + 2$**

Question 27

expands (x + 5)(x - 4) correctly	M1
expands (x - 2)(x + 6) correctly	M1
$2x^2 + 5x - 32$ cao	A1

Answer: **$2x^2 + 5x - 32$**

Question 28

$x^2 + 3x + 2$ cao	B1

Answer: **$x^2 + 3x + 2$**

Question 29

$x^2 + 3x - 4$ cao	B1

Answer: **$x^2 + 3x - 4$**

Question 30

three or four correct terms before collecting	M1
$9x^2 - 4$ cao	A1

Answer: **$9x^2 - 4$**

Question 31

writes as (x + 9)(x + 9) and expands	M1
$x^2 + 18x + 81$ cao	A1

Answer: **$x^2 + 18x + 81$**

Question 32

writes as (2x - 5)(2x - 5) and expands	M1
$4x^2 - 20x + 25$ cao	A1

Answer: **$4x^2 - 20x + 25$**

Question 33

three or four correct terms before collecting	M1
$2x^2 + 13x + 21$ cao	A1

Answer: **$2x^2 + 13x + 21$**

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