2.4 Algebra: 1-hour Pack

ISEB CE.M4 · Calculator allowed · about 60 minutes

Total Marks

Name: _____ Date: ____ / ____ / _____

Answer ALL questions. Show all your working.

1 Work out the value of $(7x + 3)(y - 1)$ when $x = -5$ and $y = 5$.

- [ ] A) -128
- [ ] B) -100
- [ ] C) 192
- [ ] D) -228
- [ ] E) 152

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2 Simplify $7 - 5y - 4y + 4x - 3x$

- [ ] A) $-7x - 9y + 7$
- [ ] B) $x - 9y + 7$
- [ ] C) $x - 9y - 7$
- [ ] D) $7x - 9y + 7$
- [ ] E) $-8x + 7$

---

3 Expand and simplify $(x + 5)(x + 4)$

- [ ] A) $x^2 + 9x + 9$
- [ ] B) $x^2 - 9x + 20$
- [ ] C) $x^2 + 9x + 20$
- [ ] D) $x^2 + 9x - 20$
- [ ] E) $x^2 + 20$

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4 Expand $3x(x - 9)$

- [ ] A) $x^2 - 27x$
- [ ] B) $3x^2 - 9x$
- [ ] C) $3x^2 + 27x$
- [ ] D) $-27x^2 + 3x$
- [ ] E) $3x^2 - 27x$

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5 Factorise fully $x^2 - 7x + 6$

- [ ] A) $(x + 1)(x + 6)$
- [ ] B) $(x - 1)(x + 6)$
- [ ] C) $(x + 1)(x - 6)$
- [ ] D) $(x - 1)(x - 6)$
- [ ] E) $(x - 7)(x + 6)$

---

6 Make t the subject of the formula $C = 9(t + 8)$.

- [ ] A) $t = C / 9 + 8$
- [ ] B) $t = C - 8 / 9$
- [ ] C) $t = 9C - 8$
- [ ] D) $t = C / 9 - 8$
- [ ] E) $t = (C + 8) / 9$

---

7 Solve the simultaneous equations $2x + 4y = 26$ and $x - 4y = -5$.

- [ ] A) $x = 7, y = 3$
- [ ] B) $x = 7, y = -3$
- [ ] C) $x = 3, y = 7$
- [ ] D) $x = 7, y = 4$
- [ ] E) $x = 8, y = 3$

---

8 Solve $3x + 4 < 13$

- [ ] A) $x < 3$
- [ ] B) $x < 4$
- [ ] C) $x > -3$
- [ ] D) $x < -3$
- [ ] E) $x > 3$

---

9 Solve $8x - 3 = 2x - 51$

- [ ] A) $x = -7$
- [ ] B) $x = -4.8$
- [ ] C) $x = -9$
- [ ] D) $x = 8$
- [ ] E) $x = -8$

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10 Solve $x^2 - 7x + 12 = 0$

- ☐ A) x = 7 or x = 12
- ☐ B) x = -4 or x = -3
- ☐ C) x = 2 or x = 5
- ☐ D) x = 3 or x = 4
- ☐ E) x = -4 or x = 3

---

11 Solve the simultaneous equations:

$3x + 2y = 16$

$x - y = 2$

(4)

---

12 Work out the value of $2x + 2y - 4$ when $x = 3$ and $y = -4$.

- ☐ A) 10
- ☐ B) -18
- ☐ C) -6
- ☐ D) -2
- ☐ E) -4

---

13 Simplify $-4x - 2y - x + 9y$

- ☐ A) 2x
- ☐ B) -5x + 7y
- ☐ C) -3x + 7y
- ☐ D) -5x - 11y
- ☐ E) 3x + 7y

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14 Expand and simplify $(x + 8)(x + 9)$

- [ ] A) $x^2 + 17x + 72$
- [ ] B) $x^2 + 72$
- [ ] C) $x^2 - 17x + 72$
- [ ] D) $x^2 + x + 72$
- [ ] E) $x^2 + 17x - 72$

---

15 Expand $9x(x + 6)$

- [ ] A) $54x^2 + 9x$
- [ ] B) $9x^2 + 54x$
- [ ] C) $9x^2 + 6x$
- [ ] D) $9x^2 - 54x$
- [ ] E) $x^2 + 54x$

---

16 Factorise fully $x^2 + 3x + 2$

- [ ] A) $(x + 2)(x + 2)$
- [ ] B) $(x - 2)(x + 1)$
- [ ] C) $(x + 3)(x + 2)$
- [ ] D) $(x + 2)(x - 1)$
- [ ] E) $(x + 2)(x + 1)$

---

17 Make x the subject of the formula $T = 2x + 9$.

- [ ] A) $x = (T - 9)2$
- [ ] B) $x = T / 2 + 9$
- [ ] C) $x = (T - 9) / 2$
- [ ] D) $x = (9 - T) / 2$
- [ ] E) $x = 2(T - 9)$

---

18 Solve the simultaneous equations $6x + 2y = -28$ and $3x - 4y = -4$.

- [ ] A) $x = -3, y = -2$
- [ ] B) $x = 4, y = 2$
- [ ] C) $x = 4, y = -2$
- [ ] D) $x = -4, y = -2$
- [ ] E) $x = -4, y = -3$

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19 Solve $2x + 6 < 2$

- [ ] A) $x < 4$
- [ ] B) $x < -5$
- [ ] C) $x < -1$
- [ ] D) $x < -3$
- [ ] E) $x < -2$

---

20 Solve $2(x + 5) = 4$

- [ ] A) $x = -3$
- [ ] B) $x = 7$
- [ ] C) $x = 3$
- [ ] D) $x = -2$
- [ ] E) $x = -0.5$

---

21 Solve $x^2 + 11x + 24 = 0$

- [ ] A) $x = -3$ or $x = 8$
- [ ] B) $x = 3$ or $x = 8$
- [ ] C) $x = -8$ or $x = -3$
- [ ] D) $x = -11$ or $x = 24$
- [ ] E) $x = -7$ or $x = -4$

---

22 Work out the value of $(5x + 7)(y - 5)$ when $x = -3$ and $y = 3$.

- [ ] A) -176
- [ ] B) 16
- [ ] C) -44
- [ ] D) 24
- [ ] E) 64

---

23 Simplify $-7x + 2x - 7y - 2y - 4$

- [ ] A) $-14x - 4$
- [ ] B) $-5x - 5y - 4$
- [ ] C) $9x - 9y - 4$
- [ ] D) $-5x - 9y - 4$
- [ ] E) $-5x - 9y + 4$

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24 Expand and simplify $(x + 6)(x + 4)$

- [ ] A) $x^2 + 24$
- [ ] B) $x^2 + 10x + 24$
- [ ] C) $x^2 - 10x + 24$
- [ ] D) $x^2 + 12x + 24$
- [ ] E) $x^2 - 2x + 24$

---

25 Expand and simplify $4(5x - 5) + 3(x - 7)$

- [ ] A) $23x + 41$
- [ ] B) $7x - 41$
- [ ] C) $23x - 12$
- [ ] D) $23x - 41$
- [ ] E) $23x + 1$

---

26 Factorise fully $8x^2 + 20x$

- [ ] A) $4x(2x - 5)$
- [ ] B) $2x(4x + 10)$
- [ ] C) $4x(2x + 5)$
- [ ] D) $4(2x^2 + 5x)$
- [ ] E) $x(8x + 20)$

---

27 Solve the simultaneous equations $5x + 3y = -23$ and $5x - 3y = 13$.

- [ ] A) $x = -1, y = -6$
- [ ] B) $x = -1, y = -5$
- [ ] C) $x = 0, y = -6$
- [ ] D) $x = -1, y = 6$
- [ ] E) $x = -6, y = -1$

---

28 Solve $4x - 3 > -19$

- [ ] A) $x > -4$
- [ ] B) $x > -5$
- [ ] C) $x < -3$
- [ ] D) $x > -3$
- [ ] E) $x < -4$

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29 Solve $2x + 8 = 7x - 52$

- ☐ A) $x = 13$
- ☐ B) $x = 8.8$
- ☐ C) $x = -12$
- ☐ D) $x = 11$
- ☐ E) $x = 12$

---

30 Solve $x^2 - 2x - 15 = 0$

- ☐ A) $x = -5$ or $x = 3$
- ☐ B) $x = 3$ or $x = 5$
- ☐ C) $x = -15$ or $x = 2$
- ☐ D) $x = -3$ or $x = 5$
- ☐ E) $x = -2$ or $x = 4$

---

31 Solve the equation $x^2 + 2x - 15 = 0$. Give both solutions.

(4)

---

32 Work out the value of $3x + 3y - 1$ when $x = 1$ and $y = -5$.

- ☐ A) -16
- ☐ B) -10
- ☐ C) -13
- ☐ D) 17
- ☐ E) -19

---

33 Simplify $x - 3x + 3y - 6y$

- ☐ A) $-2x - 9y$
- ☐ B) $-2x - 3y$
- ☐ C) $4x - 3y$
- ☐ D) $-5x$
- ☐ E) $-2x + 9y$

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34 Expand and simplify (x - 6)(x - 9)

- [ ] A) $x^2 - 13x + 54$
- [ ] B) $x^2 - 15x + 54$
- [ ] C) $x^2 + 54$
- [ ] D) $x^2 - 15x - 54$
- [ ] E) $x^2 - 3x + 54$

---

35 Expand and simplify 7(5x + 6) - 6(2x + 6)

- [ ] A) 23x + 78
- [ ] B) 23x + 42
- [ ] C) 23x - 78
- [ ] D) 47x + 78
- [ ] E) 23x + 6

---

36 Factorise fully $x^2 + 5x - 24$

- [ ] A) (x - 8)(x + 3)
- [ ] B) (x + 8)(x - 2)
- [ ] C) (x + 8)(x - 3)
- [ ] D) (x + 9)(x - 4)
- [ ] E) (x + 5)(x - 24)

---

37 Make w the subject of the formula Q = 3w - 8.

- [ ] A) w = (Q + 8) / 3
- [ ] B) w = 3(Q + 8)
- [ ] C) w = (8 - Q) / 3
- [ ] D) w = (Q - 8) / 3
- [ ] E) w = Q / 3 - 8

---

38 Solve the simultaneous equations 5x + 3y = 54 and 4x - 9y = -48.

- [ ] A) x = 6, y = 9
- [ ] B) x = 6, y = -8
- [ ] C) x = 7, y = 8
- [ ] D) x = 6, y = 8
- [ ] E) x = 8, y = 6

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39 Solve $6x - 6 < 12$

- [ ] A) $x < 4$
- [ ] B) $x < -3$
- [ ] C) $x < 1$
- [ ] D) $x > 3$
- [ ] E) $x < 3$

---

40 Solve $3(x - 6) = -30$

- [ ] A) $x = -16$
- [ ] B) $x = -8$
- [ ] C) $x = -3$
- [ ] D) $x = -4$
- [ ] E) $x = -12$

---

41 Solve $x^2 - 12x + 35 = 0$

- [ ] A) $x = 5$ or $x = 7$
- [ ] B) $x = -5$ or $x = 7$
- [ ] C) $x = -7$ or $x = -5$
- [ ] D) $x = -7$ or $x = 5$
- [ ] E) $x = 4$ or $x = 8$

---

42 Work out the value of $(2x + 7)(y - 6)$ when $x = -2$ and $y = 3$.

- [ ] A) -27
- [ ] B) -104
- [ ] C) -9
- [ ] D) -33
- [ ] E) -15

---

43 Simplify $-3y - 5x - 4y - 4 - 7x$

- [ ] A) $-12x - 7y + 4$
- [ ] B) $-12x - 7y - 4$
- [ ] C) $-12x + y - 4$
- [ ] D) $-2x - 7y - 4$
- [ ] E) $-19x - 4$

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44 Expand and simplify $(x + 6)(x + 9)$

- [ ] A) $x^2 + 15x + 15$
- [ ] B) $x^2 + 15x + 54$
- [ ] C) $x^2 - 15x + 54$
- [ ] D) $x^2 + 15x - 54$
- [ ] E) $x^2 + 54$

---

45 Expand and simplify $4(3x - 6) + 3(x + 2)$

- [ ] A) $15x - 18$
- [ ] B) $15x - 22$
- [ ] C) $15x - 30$
- [ ] D) $15x - 4$
- [ ] E) $7x - 18$

---

46 Factorise fully $x^2 - 10x + 21$

- [ ] A) $(x - 2)(x - 8)$
- [ ] B) $(x + 3)(x - 7)$
- [ ] C) $(x - 3)(x - 6)$
- [ ] D) $(x - 3)(x - 7)$
- [ ] E) $(x + 3)(x + 7)$

---

47 Make x the subject of the formula $T = x / 4 + 5$.

- [ ] A) $x = 4T - 5$
- [ ] B) $x = (T - 5) / 4$
- [ ] C) $x = 4T + 5$
- [ ] D) $x = 4(T + 5)$
- [ ] E) $x = 4(T - 5)$

---

48 Solve the simultaneous equations $x + y = 14$ and $x - y = -2$.

- [ ] A) $x = -6, y = -8$
- [ ] B) $x = 6, y = -8$
- [ ] C) $x = 6, y = 8$
- [ ] D) $x = 7, y = 8$
- [ ] E) $x = 6, y = 7$

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49 Solve $3x - 2 > 25$

- [ ] A) $x < 9$
- [ ] B) $x > 8$
- [ ] C) $x > 9$
- [ ] D) $x < -9$
- [ ] E) $x > 10$

---

50 Solve $5(x + 7) = 80$

- [ ] A) $x = 17.4$
- [ ] B) $x = 9$
- [ ] C) $x = 10$
- [ ] D) $x = 393$
- [ ] E) $x = 23$

---

51 Solve $x^2 - 3x - 10 = 0$

- [ ] A) $x = -3$ or $x = 6$
- [ ] B) $x = -10$ or $x = 3$
- [ ] C) $x = 2$ or $x = 5$
- [ ] D) $x = -2$ or $x = 5$
- [ ] E) $x = -5$ or $x = 2$

---

52 Work out the value of $7xy - 3x$ when $x = -2$ and $y = 2$.

- [ ] A) -34
- [ ] B) -11
- [ ] C) -8
- [ ] D) 22
- [ ] E) -22

---

53 Simplify $-3y - 2x + 5y - x$

- [ ] A) $-3x + 2y$
- [ ] B) $-x + 2y$
- [ ] C) $x + 2y$
- [ ] D) $-x$
- [ ] E) $-3x - 8y$

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54 Expand and simplify $(x - 3)^2$

- [ ] A) $x^2 - 4x + 9$
- [ ] B) $x^2 + 9$
- [ ] C) $x^2 - 6x - 9$
- [ ] D) $x^2 - 6x + 9$
- [ ] E) $x^2 - 6x - 6$

---

55 Expand and simplify $3(x - 7) - 8(5x + 5)$

- [ ] A) $-37x - 26$
- [ ] B) $43x + 19$
- [ ] C) $-37x - 61$
- [ ] D) $-37x + 19$
- [ ] E) $-37x - 21$

---

56 Factorise fully $25x + 35$

- [ ] A) $5(5x + 35)$
- [ ] B) $5(5x - 7)$
- [ ] C) $5(25x + 7)$
- [ ] D) $5(5x + 8)$
- [ ] E) $5(5x + 7)$

---

57 Make n the subject of the formula $A = 8n + 4$.

- [ ] A) $n = (4 - A) / 8$
- [ ] B) $n = (A - 4) / 8$
- [ ] C) $n = (A - 4)8$
- [ ] D) $n = (A + 4) / 8$
- [ ] E) $n = A - 4 / 8$

---

58 Solve the simultaneous equations $2x + 2y = 0$ and $6x - 4y = 10$.

- [ ] A) $x = -1, y = 1$
- [ ] B) $x = 1, y = -1$
- [ ] C) $x = 1, y = 1$
- [ ] D) $x = 1, y = -2$
- [ ] E) $x = 2, y = -1$

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Mark scheme · 2.4 Algebra: 1-hour Pack

Question 1

A cao (-128); substitute x = -5 and y = 5, using brackets for negatives **B1**

Answer: A) -128

Question 2

B cao (x - 9y + 7); collect each type of term **B1**

Answer: B) x - 9y + 7

Question 3

C cao (x^2 + 9x + 20); multiply every term in the first bracket by every term in the second **B1**

Answer: C) x^2 + 9x + 20

Question 4

E cao ($3x^2$ - 27x); multiply each term in the bracket **B1**

Answer: E) $3x^2$ - 27x

Question 5

D cao ((x - 1)(x - 6)); two numbers with sum b and product c **B1**

Answer: D) (x - 1)(x - 6)

Question 6

D cao (t = C / 9 - 8); undo the operations in the reverse order **B1**

Answer: D) t = C / 9 - 8

Question 7

A cao (x = 7, y = 3); eliminate one letter, solve, then substitute back **B1**

Answer: A) x = 7, y = 3

Question 8

A cao (x < 3); solve like an equation **B1**

Answer: A) x < 3

Question 9

E cao (x = -8); do the same to both sides **B1**

Answer: E) x = -8

Question 10

D cao (x = 3 or x = 4); factorise, then set each bracket to zero **B1**

Answer: D) x = 3 or x = 4

Question 11

rearrange or substitute to eliminate one variable, e.g. x = y + 2 substituted into the first equation **M1**

correct equation in one variable formed, e.g. 5y = 10 **M1**

y = 2 cao **A1**

x = 4 cao (ft from their y) **A1**

Answer: x = 4, y = 2

Question 12

C cao (-6); substitute x = 3 and y = -4, using brackets for negatives **B1**

Answer: C) -6

Question 13

B cao (-5x + 7y); collect each type of term **B1**

Answer: B) -5x + 7y

Question 14

A cao (x^2 + 17x + 72); multiply every term in the first bracket by every term in the second **B1**

Answer: A) x^2 + 17x + 72

Question 15

B cao ($9x^2$ + 54x); multiply each term in the bracket **B1**

Answer: B) $9x^2$ + 54x

Question 16

E cao ((x + 2)(x + 1)); two numbers with sum b and product c **B1**

Answer: E) (x + 2)(x + 1)

Question 17

C cao (x = (T - 9) / 2); undo the operations in the reverse order **B1**

Answer: C) x = (T - 9) / 2

Question 18

D cao (x = -4, y = -2); eliminate one letter, solve, then substitute back **B1**

Answer: D) x = -4, y = -2

Question 19

E cao (x < -2); solve like an equation **B1**

Answer: E) x < -2

Question 20

A cao (x = -3); do the same to both sides **B1**

Answer: A) x = -3

Question 21

C cao (x = -8 or x = -3); factorise, then set each bracket to zero **B1**

Answer: C) x = -8 or x = -3

Question 22

B cao (16); substitute x = -3 and y = 3, using brackets for negatives **B1**

Answer: B) 16

Question 23

D cao (-5x - 9y - 4); collect each type of term **B1**

Answer: D) -5x - 9y - 4

Question 24

B cao (x^2 + 10x + 24); multiply every term in the first bracket by every term in the second **B1**

Answer: B) x^2 + 10x + 24

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Question 25

D cao (23x - 41); expand both brackets then collect **B1**

Answer: D) 23x - 41

Question 26

C cao (4x(2x + 5)); take out the highest common factor, including x **B1**

Answer: C) 4x(2x + 5)

Question 27

A cao (x = -1, y = -6); eliminate one letter, solve, then substitute back **B1**

Answer: A) x = -1, y = -6

Question 28

A cao (x > -4); solve like an equation **B1**

Answer: A) x > -4

Question 29

E cao (x = 12); do the same to both sides **B1**

Answer: E) x = 12

Question 30

D cao (x = -3 or x = 5); factorise, then set each bracket to zero **B1**

Answer: D) x = -3 or x = 5

Question 31

factorise as (x + 5)(x - 3) = 0 **M1**

set each factor equal to zero: x + 5 = 0 or x - 3 = 0 **M1**

x = -5 cao **A1**

x = 3 cao **A1**

Answer: x = -5 or x = 3

Question 32

C cao (-13); substitute x = 1 and y = -5, using brackets for negatives **B1**

Answer: C) -13

Question 33

B cao (-2x - 3y); collect each type of term **B1**

Answer: B) -2x - 3y

Question 34

B cao (x^2 - 15x + 54); multiply every term in the first bracket by every term in the second **B1**

Answer: B) x^2 - 15x + 54

Question 35

E cao (23x + 6); expand both brackets then collect; take care with the minus **B1**

Answer: E) 23x + 6

Question 36

C cao ((x + 8)(x - 3)); two numbers with sum b and product c **B1**

Answer: C) (x + 8)(x - 3)

Question 37

A cao (w = (Q + 8) / 3); undo the operations in the reverse order **B1**

Answer: A) w = (Q + 8) / 3

Question 38

D cao (x = 6, y = 8); eliminate one letter, solve, then substitute back **B1**

Answer: D) x = 6, y = 8

Question 39

E cao (x < 3); solve like an equation **B1**

Answer: E) x < 3

Question 40

D cao (x = -4); do the same to both sides **B1**

Answer: D) x = -4

Question 41

A cao (x = 5 or x = 7); factorise, then set each bracket to zero **B1**

Answer: A) x = 5 or x = 7

Question 42

C cao (-9); substitute x = -2 and y = 3, using brackets for negatives **B1**

Answer: C) -9

Question 43

B cao (-12x - 7y - 4); collect each type of term **B1**

Answer: B) -12x - 7y - 4

Question 44

B cao (x^2 + 15x + 54); multiply every term in the first bracket by every term in the second **B1**

Answer: B) x^2 + 15x + 54

Question 45

A cao (15x - 18); expand both brackets then collect **B1**

Answer: A) 15x - 18

Question 46

D cao ((x - 3)(x - 7)); two numbers with sum b and product c **B1**

Answer: D) (x - 3)(x - 7)

Question 47

E cao (x = 4(T - 5)); undo the operations in the reverse order **B1**

Answer: E) x = 4(T - 5)

Question 48

C cao (x = 6, y = 8); eliminate one letter, solve, then substitute back **B1**

Answer: C) x = 6, y = 8

Question 49

C cao (x > 9); solve like an equation **B1**

Answer: C) x > 9

Question 50

B cao (x = 9); do the same to both sides **B1**

Answer: B) x = 9

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Question 51

D cao (x = -2 or x = 5); factorise, then set each bracket to zero **B1**

Answer: D) x = -2 or x = 5

Question 52

E cao (-22); substitute x = -2 and y = 2, using brackets for negatives **B1**

Answer: E) -22

Question 53

A cao (-3x + 2y); collect each type of term **B1**

Answer: A) -3x + 2y

Question 54

D cao (x^2 - 6x + 9); multiply every term in the first bracket by every term in the second **B1**

Answer: D) x^2 - 6x + 9

Question 55

C cao (-37x - 61); expand both brackets then collect; take care with the minus **B1**

Answer: C) -37x - 61

Question 56

E cao (5(5x + 7)); take out the highest common factor **B1**

Answer: E) 5(5x + 7)

Question 57

B cao (n = (A - 4) / 8); undo the operations in the reverse order **B1**

Answer: B) n = (A - 4) / 8

Question 58

B cao (x = 1, y = -1); eliminate one letter, solve, then substitute back **B1**

Answer: B) x = 1, y = -1

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