

The background of the page is composed of several overlapping, semi-transparent teal-colored geometric shapes, primarily triangles and polygons, creating a modern, abstract design. The colors range from a light, pale teal to a darker, more saturated teal.

CAPRA

COACHING

Year 8 Exam Booklet:
Algebra

Algebra

Name:

Easy

1. Which of the following algebraic expression represents 2 less than 3 lots of n?

- (A) $3(n - 2)$
- (B) $2 - 3n$
- (C) $3 + n - 2$
- (D) $3n - 2$

2. Which of the following is the correct simplification of $\frac{12ab}{24a^2}$?

- (A) $2ab$
- (B) $\frac{2a}{b}$
- (C) $\frac{b}{2a}$
- (D) $\frac{ab}{2}$

3. Simplify the following expression:

$$5x - 3y^2 - 8x - 4y^2$$

4. Simplify:

$$5s + 2m - 7s + 8m =$$

- (A) $-2s + 10m$
- (B) $2s + 10m$
- (C) $2s - 10m$
- (D) $-2s + 6m$

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5. Simplify:

$$6d \times dw$$

- (A) $6dw$
- (B) $6d^2w$
- (C) $6d^2w^2$
- (D) $6d$

6. Which expression does this simplify to?

$$\frac{ab}{15} \times \frac{18}{a} =$$

- (A) $\frac{a^2b}{15}$
- (B) $\frac{18a^2}{15}$
- (C) $\frac{18ab}{15}$
- (D) $\frac{6b}{5}$

7. Expand and fully simplify:

(i) $2(x - 8)$

(ii) $4(x - 4) - 2(x + 1)$

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8. Fully simplify:

(i) $\frac{3s}{6} + \frac{5s}{6}$

(ii) $\frac{w}{3} - \frac{2w}{7}$

9. Expand and simplify the following:

(i) $3(x - 6)$

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(ii) $2x(3 - 4x)$

(iii) $7 - 4(5 + 2x)$

10. Full factorise the following:

$3g + 12$

11. What is $-2x(x - 3)$ simplified? (Circle the correct answer)

(A) $-2x - 3$

(B) $-2x^2 - 6x$

(C) $-2x^2 + 6x$

(D) $-2x + 6x$

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12. Which answer is a fully simplified form of $7p + 5p^2 - 39$? (Circle the correct answer)

(A) $9p^2$

(B) $4p + 5p^2$

(C) $10p + 5p^2$

(D) $10p - 5p^2$

13. Fully simplify:

(i) $5mp + 2m - 7pm =$

(ii) $4ab \times 3a =$

(iii) $\frac{10bc}{15c} =$

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(iv) $\frac{2m}{3} - \frac{m}{4} =$

14. Simplify each expression.

(i) $(m^6)^3 =$

(ii) $(2p^7)^4 =$

15. Factorise fully:

$4x + 8 =$

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16. Simplify:

(i) $4a \times 3a^2$

(ii) $(m^4)^5$

17. Simplify

(i) $a^3 \times a^4$

(ii) $-4y^3 \div 12y$

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18. Factorise:

$$3m + 18$$

19. Which expression does this simplify to?

$$\frac{2m}{5} + \frac{m}{3} =$$

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20. Expand and simplify:

(i) $-3(2x - y)$

(ii) $5 - 2(x - 3)$

21. Write down the expression for the number of weeks in m days.

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Medium

22. Simplify:

$$4k + 6k \div 2$$

23. Simplify the following

(i) $3y \times 4y^2$

(ii) $a^2b \times ab^2$

(iii) $(3x^2)^3$

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- 24.** Fully simplify:

$$(-5mn) \times (-7mp) \times (2np) =$$

- 25.** Full simplify:

$$\frac{40a}{77b} \div \frac{36a^2}{35b^2}$$

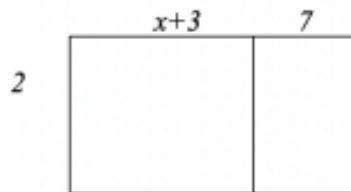
- 26.** Fully factorise:

$$12x^2y - 18xy$$

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27. What is the fully factorised form of $14bm^2 - 7b^2m$? (Circle the correct answer)

28. Which expression represents the total area of the following rectangle?



(Circle the correct answer)

- (A) $2(x + 3) + 2 \times 7$
- (B) $2(x + 10)$
- (C) $2x + 20$
- (D) All of the above

29. Fully simplify each expression.

(i) $\frac{ab}{12c} \times \frac{6a}{b} =$

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(ii) $\frac{vw}{21} \div \frac{tv}{49} =$

30. Factorise fully:

$$9xy^2 - 12x^2y =$$

31. Simplify:

(i) $\frac{x}{y} - \frac{2x}{3a}$

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(ii) $\frac{3x+7}{4} - \frac{x-1}{3}$

32. Factorise:

$$2a^2b - 4ab$$

33. Simplify:

(i) $\frac{2t}{7} - \frac{t}{6}$

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(ii) $\frac{x}{3} \div \frac{5x^2}{6}$

34. Simplify:

$$\frac{x+1}{6} + \frac{2-x}{5}$$

35. Fully factorise:

$$\frac{re^2}{11} - \frac{r^2e^3}{11}$$

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36. Expand, and simplify if possible

(i) $5(a + 4) =$

(ii) $2m(3m - 4) + 3m =$

(iii) $a(b - a) - b(a - b) =$

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37. Expand and simplify:

$$(x + 7)(x + 3).$$

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Hard

- 38.** The following is a magic square.
Fill in the empty squares in the box so that all rows and columns add or subtract to the magic sum of $3 - 3$.

		x
$x - 2$	$x + 3$	

- 39.** Fully simplify:

$$\frac{b^3}{22} \times \frac{108}{ab^4} \div \frac{27a}{55b} =$$

- 40.** Fully simplify:

$$1 - \frac{a}{a - b} - \frac{a - b}{a + b}$$

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41. Simplify:

$$\frac{\frac{1}{x}}{2 + \frac{3}{x}}$$

42. Expand and simplify

$$(x + 4y)^2 - (x + 6y)(x - 6y).$$

43. Expand and simplify:

(i) $(4x + 2)(5x - 7)$

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(ii) $(5x - 3)(2x^2 - 3x + 2)$

(iii) $(4x - 1)^2 - (-x + 2)^2$

44. Factorise fully:

(i) $6x^2y^2 - 8xy^3$

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(ii) $p^4 - 16y^4$