

Section I — Multiple choice

1 Simplify $10a - 4 + 8a + 12$.

A $2a + 16$

B $18a - 8$

C $18a + 8$

D $18a + 16$

2 Use the formula $A = \frac{1}{2}(a+b)h$ to find A when $a = 3$, $b = 7$ and $h = 10$.

A 10

B 50

C 105

D 200

3 Multiply and simplify the expression $2f^2 \times -3f^3$.

A $-6f^6$

B $6f^5$

C $-6f^5$

D $6f^6$

4 Simplify $\frac{12c}{40cd}$.

A $\frac{3c}{10d}$

B $\frac{3}{10d}$

C $\frac{3}{d}$

D $\frac{1}{d}$

5 Expand $3(2a - b) - (a + b)$.

A $5a - 2b$

B $7a - 4b$

C $7a - 2b$

D $5a - 4b$

6 What is the solution to the equation $5(y - 3) = 10$?

A $y = 1$

B $y = 3$

C $y = 4$

D $y = 5$

7 Solve the equation $15y - 9 = 2y + 6$.

A $y = \frac{3}{13}$

B $y = \frac{15}{13}$

C $y = \frac{15}{17}$

D $y = -\frac{3}{13}$

8 Find the value of $5e(h + 4)$ if $e = 3$ and $h = -2$.

A -30

B -15

C 15

D 30

Topic Test 2 Algebraic manipulation

Section II — Short answer

1 Simplify $10ab + 2a + 7ba - 3a$ by collecting the like terms.

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2 Simplify the following algebraic fractions.

a $\frac{3p^2}{2q} \times \frac{q}{9p}$

b $\frac{6x}{7} - \frac{5x}{7}$

c $\frac{a}{5} + \frac{3a}{2}$

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3 Remove grouping symbols and simplify if required.

a $2(d-3)$

b $3x^2(2-x)$

c $3(w-5) - 2(w+1)$

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4 Fully factorise these expressions.

a $6z + 30$

b $15a - 35b$

c $21m - 15n + 3$

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5 Solve the following linear equations.

a $2t + 3 = 11$

b $6x - 2 = 2x + 6$

c $\frac{2w}{5} + 3 = 7$

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6 Given $T = 2\pi\sqrt{\frac{l}{g}}$, find T when $l = 75$ and $g = 3$. (Answer correct to one decimal place.)

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Topic Test 2 Algebraic manipulation

Worked solutions

Section 1	Solution	Answer
1	$10a - 4 + 8a + 12 = 18a + 8$	C
2	$A = \frac{1}{2}(a+b)h$ $= \frac{1}{2} \times (3+7) \times 10$ $= 50$	B
3	$2f^2 \times -3f^3 = -6f^5$	C
4	$\frac{12c}{40cd} = \frac{3}{10d}$	B
5	$3(2a-b) - (a+b) = 6a - 3b - a - b$ $= 5a - 4b$	D
6	$5(y-3) = 10$ $5y - 15 = 10$ $5y = 25$ $y = 5$	D
7	$15y - 9 = 2y + 6$ $13y = 15$ $y = \frac{15}{13}$	B
8	$5e(h+4) = 5 \times 3 \times (-2+4)$ $= 30$	D

Section II	Solution
1	$10ab + 2a + 7ba - 3a = 17ab - a$
2a	$\frac{3p^2}{2q} \times \frac{q}{9p} = \frac{p}{6}$
2b	$\frac{6x}{7} - \frac{5x}{7} = \frac{x}{7}$
2c	$\frac{a}{5} + \frac{3a}{2} = \frac{2a}{10} + \frac{15a}{10}$ $= \frac{17a}{10}$
3a	$2(d - 3) = 2d - 6$
3b	$3x^2(2 - x) = 6x^2 - 3x^3$
3c	$3(w - 5) - 2(w + 1) = 3w - 15 - 2w - 2$ $= w - 17$
4a	$6z + 30 = 6(z + 5)$
4b	$15a - 35b = 5(3a - 7b)$
4c	$21m - 15n + 3 = 3(7m - 5n + 1)$
5a	$2t + 3 = 11$ $2t = 8$ $t = 4$
5b	$6x - 2 = 2x + 6$ $4x - 2 = 6$ $4x = 8$ $x = 2$
5c	$\frac{2w}{5} + 3 = 7$ $\frac{2w}{5} = 4$ $2w = 20$ $w = 10$
6	$T = 2\pi\sqrt{\frac{L}{g}}$ $= 2\pi\sqrt{\frac{75}{3}}$ $= 31.4$