Fully-Worked Solutions

PRACTICE 2

Section A

1 $-2x(5x - 6y + 7) = -10x^2 + 12xy - 14x$

Answer: **D**

2 $(4m + 5n)(2m - 3n) = 8m^2 - 12mn + 10mn - 15n^2$

$= 8m^2 - 2mn - 15n^2$

Answer: **A**

3 $(6m - 5)^2 = (6m - 5)(6m - 5)$

$= 36m^2 - 30m - 30m + 25$

$= 36m^2 - 60m + 25$

Answer: **C**

4 $(2x + 3y)(2x - 3y) + 2x(x - 5y)$

$= 4x^2 - 6xy + 6xy - 9y^2 + 2x^2 - 10xy$

$= 6x^2 - 9y^2 - 10xy$

Answer: **B**

5 $\text{Area} = \frac{1}{2}(3x - 1 + 5x + 3)(3x)$

$= \frac{3x}{2}(8x + 2)$

$= 12x^2 + 3x$

Answer: **A**

6 $100 - 4m^2 = 4(25 - m^2)$

$= 4(5^2 - m^2)$

$= 4(5 + m)(5 - m)$

Answer: **D**

7

$3x$ →	-5	$-5x$
x →	8	$24x$
$3x^2$	-40	$19x$

$(3x - 5)(x + 8)$

Answer: **C**

8

$4y$ →	-3	$3y$
$-y$ →	$+7$	$28y$
$-4y^2$	-21	$31y$

$(4y - 3)(7 - y)$

Answer: **B**

9 $4mx + 14ny - 8my - 7nx$

$= 4mx - 8my - 7nx + 14ny$

$= 4m(x - 2y) - 7n(x - 2y)$

$= (4m - 7n)(x - 2y)$

Answer: **A**

10 Number of boxes

$= \frac{48m^2 + 34m + 6}{6m + 2}$

$= \frac{(8m + 3)(6m + 2)}{6m + 2}$

$= 8m + 3$

Answer: **B**

11 $\frac{8}{9y} - \frac{2}{3y} = \frac{8}{9y} - \frac{2(3)}{3y(3)}$

$= \frac{8 - 6}{9y}$

$= \frac{2}{9y}$

Answer: **D**

12 $\frac{5a}{8} + \frac{2b}{3c} = \frac{5a(3c)}{8(3c)} + \frac{2b(8)}{3c(8)}$

$= \frac{15ac + 16b}{24c}$

Answer: **D**

13 $\frac{m}{6x} - \frac{3m}{16xy} = \frac{m(8y)}{6x(8y)} - \frac{3m(3)}{16xy(3)}$

$= \frac{8my - 9m}{48xy}$

Answer: **A**

14 $\frac{4a^2 - 9}{5ab} \times \frac{2a^2}{2a - 3}$

$= \frac{(2a - 3)(2a + 3)}{5ab} \times \frac{2a^2}{2a - 3}$

$= \frac{2a + 3}{5b} \times 2a$

$= \frac{2a(2a + 3)}{5b}$

Answer: **C**

15 $\frac{4m^2 - n^2}{6m + 9n} \div \frac{(2m + n)^2}{4m + 6n}$

$= \frac{(2m - n)(2m + n)}{3(2m + 3n)} \times \frac{2(2m + 3n)}{(2m + n)(2m + n)}$

$= \frac{2m - n}{3} \times \frac{2}{2m + n}$

$= \frac{2(2m - n)}{3(2m + n)}$

Answer: **D**

16 $\frac{3}{7b}(14a - 21b) - \frac{a}{2b}$

$= \frac{3}{7b} \times 7(2a - 3b) - \frac{a}{2b}$

$= \frac{3(2a - 3b)}{b} - \frac{a}{2b}$

$= \frac{6(2a - 3b)}{2b} - \frac{a}{2b}$

$= \dfrac{12a - 18b - a}{2b}$

$= \dfrac{11a - 18b}{2b}$

Answer: **B**

Section B

1 (a) (i) $(3p - 4)^2 = (3p - 4)(3p - 4)$
$= 9p^2 - 12p - 12p + 16$
$= 9p^2 - 24p + 16$

(ii) $(3p - 4)(3p + 4) = 9p^2 + 12p - 12p - 16$
$= 9p^2 - 16$

(b) (i) Area $= (3x - 2)(3x - 2)$
$= 9x^2 - 6x - 6x + 4$
$= (9x^2 - 12x + 4)\ \text{cm}^2$

(ii) Area $= (4x + 3)(2x - 1)$
$= 8x^2 - 4x + 6x - 3$
$= (8x^2 + 2x - 3)\ \text{cm}^2$

2 (a) $\dfrac{8m}{2m} = 4$ and $\dfrac{12mn}{2m} = 6n$

$\dfrac{8m}{4} = 2m$ and $\dfrac{12mn}{4} = 3mn$

Answer $= 2m, 4$

(b) (i) $8(5 - 2x) = 40 - 16x$

(ii) $-5m(n + 4) = -5mn - 20m$

3 (a) $25m^2 - 81 = (5m)^2 - 9^2$
$= (5m + 9)(5m - 9)$ [✗]

(b) $(5n + 4)(3n - 2) = 15n^2 - 10n + 12n - 8$
$= 15n^2 + 2n - 8$ [✓]

(c) $(3x - 7)(5 - x) = 15x - 3x^2 - 35 + 7x$
$= -3x^2 + 22x - 35$ [✗]

(d) $5ab - 15ad + 4bc - 12cd$
$= 5a(b - 3d) + 4c(b - 3d)$
$= (5a + 4c)(b - 3d)$ [✓]

Section C

1 (a) (i) $p(5 - q) = 5p - pq$

(ii) $14mn + 16m - 35n - 40$
$= 2m(7n + 8) - 5(7n + 8)$
$= (2m - 5)(7n + 8)$

(b) $\dfrac{5}{7m} - \dfrac{\frac{1}{3}(5 - 9n)}{7m} = \dfrac{5}{7m} - \dfrac{5 - 9n}{21m}$

$= \dfrac{5(3)}{7m(3)} - \dfrac{5 - 9n}{21m}$

$= \dfrac{15 - (5 - 9n)}{21m}$

$= \dfrac{10 + 9n}{21m}$

(c) $\dfrac{mn + 7n}{8n} \div \dfrac{m^2 - 49}{24}$

$= \dfrac{n(m + 7)}{8n} \times \dfrac{24}{(m - 7)(m + 7)}$

$= \dfrac{3}{m - 7}$

2 (a) (i) $-6p(q - 3) = -6pq + 18p$

(ii)

$3x$	-5	$-10x$
$2x$	7	$21x$
$6x^2$	-35	$11x$

$6x^2 + 11x - 35 = (3x - 5)(2x + 7)$

(b) Area of shaded region
= Area of trapezium – Area of triangle

$= \dfrac{1}{2}(3x + 2 + 7x - 4)(4x + 1) - \dfrac{1}{2}(3x + 2)(x + 4)$

$= \dfrac{1}{2}(10x - 2)(4x + 1) - \dfrac{1}{2}(3x^2 + 12x + 2x + 8)$

$= (5x - 1)(4x + 1) - \dfrac{3}{2}x^2 - 7x - 4$

$= 20x^2 + 5x - 4x - 1 - \dfrac{3}{2}x^2 - 7x - 4$

$= \dfrac{37}{2}x^2 - 6x - 5\ \text{cm}^2$

(c) $\dfrac{3}{4q} - \dfrac{2p - 9}{12q} = \dfrac{3(3)}{4q(3)} - \dfrac{2p - 9}{12q}$

$= \dfrac{9 - (2p - 9)}{12q}$

$= \dfrac{9 - 2p + 9}{12q}$

$= \dfrac{18 - 2p}{12q}$

$= \dfrac{2(9 - p)}{12q}$

$= \dfrac{9 - p}{6q}$