Year 9 collecting like terms worksheet

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Name: _____ Date: _____

Question 1

Simplify:

(a) $4ab - 7ab + 2ab$

(b) $3x^2 + 5x - x^2 - 8x$

Answer: _____

Question 2

Simplify:

(a) $-3m \times 4mn$

(b) $18x^2y \div (6xy)$

Answer: _____

Question 3

Simplify:

(a) $12ab/4b$

(b) $5p \times (-2q) \times 3p$

Answer: _____

Question 4

A triangle has sides of length $(2a + 3b)$ cm, $(4a - b)$ cm and $(a + 2b)$ cm.

(a) Write a simplified expression for the perimeter.

(b) Find the perimeter when $a = 3$ and $b = 2$.

(c) A square has the same perimeter as the triangle. Write an expression for the side length of the square, and find it when $a = 3$ and $b = 2$.

Answer: _____

Question 5

Simplify $(6ab \times 2a)/(4b)$.

Answer: _____

Question 6

Simplify $7mn - 3m + 2mn + 5m - mn$.

Answer: _____

Question 7

Simplify:

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

(b) $4a \times 3b$

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

Answer: _____

Year 9 collecting like terms: answers and worked solutions

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Question 1

Key idea: Only like terms (same pronumerals with the same powers) can be added or subtracted.

1. (a) 4 - 7 + 2 = -1, so 4ab - 7ab + 2ab = -ab 2. (b) x^2 terms: $3x^2 - x^2 = 2x^2$; x terms: 5x - 8x = -3x, giving $2x^2 - 3x$

Answer: (a) -ab (b) $2x^2 - 3x$

Question 2

Key idea: Multiply or divide the numbers first, then the pronumerals. $m \times m = m^2$, and a pronumeral divided by itself is 1.

1. (a) $-3 \times 4 = -12$ and $m \times m \times n = m^2n$, so $-12m^2n$ 2. (b) $(18x^2y)/(6xy) = 18/6 \times (x^2)/(x) \times y/y = 3 \times x \times 1 = 3x$

Answer: (a) $-12m^2n$ (b) $3x$

Question 3

Key idea: Cancel common factors in a fraction. When multiplying, multiply the numbers and then collect the pronumerals.

1. (a) 12/4 = 3 and ab/b = a, so 3a 2. (b) $5 \times (-2) \times 3 = -30$ and $p \times q \times p = p^2q$, so $-30p^2q$

Answer: (a) 3a (b) $-30p^2q$

Question 4

Key idea: Perimeter is the sum of the side lengths. Collect the a terms and the b terms separately.

1. (a) a terms: 2a + 4a + a = 7a; b terms: 3b - b + 2b = 4b; perimeter = 7a + 4b 2. (b) 7(3) + 4(2) = 21 + 8 = 29 3. (c) A square has 4 equal sides, so each side is (7a + 4b)/(4) 4. (c) When a = 3 and b = 2: 29/4 = 7.25

Answer: (a) (7a + 4b) cm (b) 29 cm (c) (7a + 4b)/(4) cm, which is 7.25 cm

Question 5

Key idea: Multiply the numerators, then cancel common factors.

1. $6ab \times 2a = 12a^2b$ 2. $(12a^2b)/(4b) = 3a^2$

Answer: $3a^2$

Question 6

Key idea: Only like terms can be added or subtracted.

1. mn terms: 7mn + 2mn - mn = 8mn 2. m terms: -3m + 5m = 2m

Answer: 8mn + 2m

Question 7

Answer: (a) 3x + 4y (b) 12ab (c) $x^2 + 8x$