

SIMPLIFYING ALGEBRA - PRACTICE QUESTIONS



1.

Simplify:

$$(a) x + x = 2x$$

$$(b) y + y + y = 3y$$

$$(c) z + z + z + z = 4z$$

$$(d) 2a + 5a = 7a$$

$$(e) 9b + 2b = 11b$$

$$(f) 10c - 4c = 6c$$

$$(g) 5d + 3d - 2d = 6d$$

$$(h) 8e - 4e + e = 5e$$

$$(i) 7f - f - 2f = 4f$$

$$(j) 4x - 3x + 5x - x = 5x$$

$$(k) 3xy - 5xy - 2xy + 8xy = 4xy$$

2.

Simplify:

$$(a) y \times y = y^2$$

$$(b) z \times z \times z \times z = z^4$$

$$(c) a \times b = ab$$

$$(d) 4 \times c \times d = 4cd$$

$$(e) 7 \times e \times f = 7ef$$

$$(f) 10 \times g \times g = 10g^2$$

$$(g) 4 \times 6 \times h = 24h$$

$$(h) 9 \times k \times 2 = 18k$$

$$(i) p \times 3 \times p = 3p^2$$

$$(j) a \times 4 \times a \times 4 = 16a^2$$

$$(k) 11 \times y \times z \times 3 = 33yz$$

3.

Simplify:

- (a) $x + 1 + x + 2 = 2x + 3$
(b) $3x + 2 + x + 7 = 4x + 9$
(c) $7a + 3 + a + 8 = 8a + 11$
(d) $8b - 2 + 2b - 5 = 10b - 7$
(e) $5c - 6 + 2c - 3 = 7c - 9$
(f) $10d - 5 - 2d - 2 = 8d - 7$
(g) $9e - 1 + 2e + 5 = 11e + 4$
(h) $7f - 3 + 2f + 4 = 9f + 1$
(i) $6g - 5 + g + 7 = 7g + 2$
(j) $4xy + 3 + 2xy - 5 = 6xy - 2$
(k) $yz + 4 + 4yz - 8 = 5yz - 4$

4.

Simplify:

- (a) $x + y + x + y = 2x + 2y$
(b) $2x + 3y + 4x + 5y = 6x + 8y$
(c) $4a + b + 2a + b = 6a + 2b$
(d) $10c - 3d + c - 2d = 11c - 5d$
(e) $5e - 4f + 2e - 3f = 7e - 7f$
(f) $6g - 3h + g + 2h = 7g - h$
(g) $7i - 5j + 3i + 2j = 10i - 3j$
(h) $4m - 6n + m + 4n = 5m - 2n$
(i) $3p - q + 3p + 4q = 6p + 3q$
(j) $5r + 2s - 2r - 4s = 3r - 2s$
(k) $6t + 3u - 5t - 5u = t - 2u$
(l) $-2x + 4y + 5x - 3y = 3x + y$

5.

Simplify:

$$(a) x^2 \times x^3 = x^5$$

$$(b) y^4 \times y^5 = y^9$$

$$(c) z^6 \times z^2 = z^8$$

$$(d) a^7 \times a^8 = a^{15}$$

$$(e) b^{11} \times b^5 = b^{16}$$

$$(f) a^9 \times a = a^{10}$$

$$(g) b^{12} \times b = b^{13}$$

$$(h) c^2 \times c^2 \times c^2 = c^6$$

$$(i) d^2 \times d^3 \times d^4 = d^9$$

$$(j) e^2 \times f^3 \times e^4 \times f^5 = e^6 f^8$$

$$(k) g^6 \times h \times g^3 \times h^4 = g^9 h^5$$

6.

Simplify:

$$(a) 4y \times 2y = 8y^2$$

$$(b) 5x^2 \times 3x^4 = 15x^6$$

$$(c) 10a^3 \times 4a^4 = 40a^7$$

$$(d) 6b^5 \times 2b^5 = 12b^{10}$$

$$(e) 8c^6 \times 3c^3 = 24c^9$$

$$(f) 11d^7 \times 4d^4 = 44d^{11}$$

$$(g) 6e^5 \times 6e^6 = 36e^{11}$$

$$(h) 7f^{10} \times 4f = 28f^{11}$$

$$(i) 12g^7 \times 3g = 36g^8$$

$$(j) 15h^4 \times h = 15h^5$$

$$(k) x^6 \times 6x^7 = 6x^{13}$$

$$(l) 4y^4 \times 9y^6 = 36y^{10}$$

7.

Simplify:

- (a) $x^7 \div x^2 = x^5$
(b) $y^{10} \div y^4 = y^6$
(c) $a^{11} \div a^6 = a^5$
(d) $b^9 \div b = b^8$
(e) $c^{12} \div c^8 = c^4$
(f) $d^{10} \div d = d^9$
(g) $12x^6 \div 4x^3 = 3x^3$
(h) $20y^{13} \div 5y^8 = 4y^5$
(i) $18a^9 \div 9a^7 = 2a^2$
(j) $32b^{12} \div 8b = 4b^{11}$
(k) $27c^{10} \div 9c = 3c^9$
(l) $45d^{20} \div 5d^8 = 9d^{12}$

8.

Simplify:

- (a) $\frac{21x^5}{3x^2} = 7x^3$
(b) $\frac{35y^{11}}{7y^4} = 5y^7$
(c) $\frac{42z^{15}}{6z^5} = 7z^{10}$
(d) $\frac{50a^{14}}{10a^7} = 5a^7$
(e) $\frac{40b^6}{20b} = 2b^5$
(f) $\frac{30c^{12}}{6c} = 5c^{11}$
(g) $\frac{60d^{23}}{5d^4} = 12d^{19}$

9.

Simplify:

$$(a) (x^2)^3 = x^6$$

$$(b) (y^6)^2 = y^{12}$$

$$(c) (z^5)^4 = z^{20}$$

$$(d) (a^{11})^5 = a^{55}$$

$$(e) (b^9)^3 = b^{27}$$

$$(f) (c^8)^8 = c^{64}$$

$$(g) (3d^4)^2 = 9d^8$$

$$(h) (2e^7)^3 = 8e^{21}$$

$$(i) (4f^3)^2 = 16f^6$$

$$(j) (2g^2)^4 = 16g^8$$

$$(k) (h \times h)^4 = h^8$$

$$(l) (m^7 \div m^4)^5 = m^{15}$$

10.

Simplify:

$$(a) x^2 + x^2 = 2x^2$$

$$(b) x^3 + x^3 = 2x^3$$

$$(c) y^2 + y^2 + y^2 = 3y^2$$

$$(d) 3a^2 + 5a^2 = 8a^2$$

$$(e) 4b^2 + 3b + 2b^2 + b = 6b^2 + 4b$$

$$(f) 6c^2 + c + 7c + 2c^2 = 8c^2 + 8c$$

$$(g) 8d^2 - 3d + d^2 - 4d = 9d^2 - 7d$$

$$(h) 5e - 4e^2 + 2e^2 + 6e = 11e - 2e^2$$

$$(i) 5f^2 - 2f - 2f^2 + 6f = 3f^2 + 4f$$

$$(j) 7g^2 + 3g - 5g^2 - 4g = 2g^2 - g$$

$$(k) 2h^2 - 5h + 3h^2 + 2h = 5h^2 - 3h$$

11.

Simplify:

$$\begin{aligned} \text{(a)} \quad 4xy \times 3x^2 &= 12x^3y \\ \text{(b)} \quad 5mn^2 \times 5m^3 &= 25m^4n^2 \\ \text{(c)} \quad 6p^3q \times 3p^2q &= 18p^5q^2 \\ \text{(d)} \quad 8a^4b^2 \times 4b^2a &= 32a^5b^4 \\ \text{(e)} \quad 9c^5d^3 \times 5c^2d^6 &= 45c^7d^9 \\ \text{(f)} \quad 12e^{10}f \times 3e^2f^5 &= 36e^{12}f^6 \\ \text{(g)} \quad 4hg^4 \times 6hg^2 &= 24h^2g^6 \\ \text{(h)} \quad 20x^8y^{11} \times 4y^4x &= 80x^9y^{15} \end{aligned}$$

12.

Simplify:

$$\begin{aligned} \text{(a)} \quad 25xy^4 \div 5y^2 &= 5xy^2 \\ \text{(b)} \quad 20m^6n^2 \div 4m^3 &= 5m^3n^2 \\ \text{(c)} \quad 27p^8q^5 \div 9p^4q &= 3p^4q^4 \\ \text{(d)} \quad 42a^3b^4 \div 7ab^3 &= 6a^2b \\ \text{(e)} \quad \frac{36c^5d^6}{3c^2d^4} &= 12c^3d^2 \\ \text{(f)} \quad \frac{32e^{11}f^7}{8e^4f^5} &= 4e^7f^2 \\ \text{(g)} \quad \frac{60g^9h^8}{12hg^5} &= 5g^4h^7 \\ \text{(h)} \quad \frac{100j^{13}k^5}{20j^5k^4} &= 5j^8k \end{aligned}$$

13.

Simplify fully:

$$\begin{aligned} \text{(a)} \quad \frac{x^5 \times x^7}{x^4} &= \frac{x^{12}}{x^4} = x^8 \\ \text{(b)} \quad \frac{y^9 \times y^4}{y^7} &= \frac{y^{13}}{y^7} = y^6 \end{aligned}$$

$$(c) \frac{z^{10} \times z}{z^9} = \frac{z^{11}}{z^9} = z^2$$

$$(d) \frac{a^5 \times a^8}{a^3 \times a^4} = \frac{a^{13}}{a^7} = a^6$$

$$(e) \frac{(b^4)^4}{b^9} = \frac{b^{16}}{b^9} = b^7$$

$$(f) \frac{(c^5)^3}{c^{11}} = \frac{c^{15}}{c^{11}} = c^4$$

$$(g) \frac{10d^3 \times 3d^5}{6d^7} = \frac{30d^8}{6d^7} = 5d$$

$$(h) \frac{4e^9 \times 6e^5}{(e^4)^3} = \frac{24e^{14}}{e^{12}} = 24e^2$$

14.

Simplify:

$$(a) 3x + 5y + x + 4y = 4x + 9y$$

$$(b) z^4 \times z^6 = z^{10}$$

$$(c) \frac{a^9}{a} = a^8$$

$$(d) 3b^2 \times 6b^8 = 18b^{10}$$

$$(e) 5c - 4d + 2c - 5d = 7c - 9d$$

$$(f) 4 \times 5 \times e = 20e$$

$$(g) f \times f \times f \times f = f^4$$

$$(h) gh + gh = 2gh$$

$$(i) 10j^2 + j + 3j - 4j^2 = 6j^2 + 4j$$

$$(j) \frac{24m^7}{8m^5} = 3m^2$$

$$(k) 15p^5q^3 \times 3pq^7 = 5p^6q^{10}$$

$$(l) \frac{t^7 \times t^8}{t^5} = t^{10}$$

15.

Simplify:

$$(a) 4x + 6 - 3x + 10 = x + 16$$

$$(b) 7 \times y \times z = 7yz$$

$$(c) 7a - 2b - a + 5b = 6a + 3b$$

$$(d) 9 \times c \times c = 9c^2$$

$$(e) \frac{54d^{12}}{9d^7} = 6d^5$$

$$(f) (e^4)^5 = e^{20}$$

$$(g) 9f^6 \times 9f = 81f^7$$

$$(h) \frac{35g^{11}h^8}{7h^7g^4} = 5g^7h$$

$$(i) p^3 + p^2 + 2p^3 + 4p^2 = 3p^3 + 5p^2$$

$$(j) 7q - (q + 3q) = 7q - q - 3q = 3q$$

16.

Simplify:

$$(a) x + x + x + x - x = 3x$$

$$(b) 12 \times y \times z^2 \times 3 = 36yz^2$$

$$(c) 48a^{21} \div 8a = 6a^{20}$$

$$(d) \frac{b^2 \times b^9}{b^5 \times b^3} = \frac{b^{11}}{b^8} = b^3$$

$$(e) 4cd + cd - 3cd = 2cd$$

$$(f) 13e^4f^{10} \times 3ef^5 = 39e^5f^{15}$$

$$(g) (3g^8)^3 = 27g^{24}$$

$$(h) \frac{6h^5 \times 4ih^8}{3h^7i} = \frac{24ih^{13}}{3h^7i} = 8h^6$$

$$(i) \frac{(j^3 \times j^8)^2}{j^7} = \frac{j^{22}}{j^7} = j^{15}$$

$$(j) 8k^5m \times 7k^{11}m^3 = 56k^{16}m^4$$