

Exercise 1.1


1. Simplify the following and express your answers in index form.

(a) $11^3 \times 11^4$

(b) $\frac{5^6}{5^3}$

(c) $(18^4)^3$

(d) $6^3 \times 6^4$

(e) $\frac{7^6}{7^4}$

(f) $(13^6)^2$

(g) $2^2 \times 2^5 \times 2^6$

(h) $\frac{2^5 \times 2^6}{2^7}$

(i) $(7^2 \times 7^3)^5$

(j) $5^6 \times 5^7 \times 5^2$

(k) $\frac{5^4 \times 5^5}{5^6}$

(l) $(5^6 \times 5^2)^3$

(m) $7^4 \times 11^2 \times 11^5 \times 7^2$

(n) $\frac{11^4}{11^2 \times 5^2 \times 5^3}$

(o) $\frac{3^6 \times 3^5}{2^4 \times 2^5}$

(p) $17^2 \times 11^4 \times 17^3 \times 11^5$

(q) $\frac{17^5}{7^2 \times 7^5 \times 17^3}$

(r) $\frac{7^9 \times 2^5}{2^4 \times 7^2}$

2. Simplify the following and express your answers in index form.

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

(b) $\frac{42^2}{6^2}$

(c) $\frac{6^3}{9^3}$

(d) $3^3 \times 2^3$

(e) $\frac{24^4}{8^4}$

(f) $\frac{35^2}{42^2}$

(g) $\frac{6^2 \times 6^4}{2^3 \times 3^3}$

(h) $\frac{3^2 \times 2^4 \times 3^5}{6^4}$

(i) $\frac{(3^2)^3 \times 4^6}{2^6}$

(j) $\frac{2^9 \times 3^5}{2^2 \times 6^5}$

(k) $\frac{6^7}{6^2 \times 3^3 \times 2^3}$

(l) $\frac{3^6 \times 4^4}{3^2 \times 2^4}$

(m) $\frac{4^5 \times 3^5}{2^3 \times 2^2}$

(n) $\frac{6^7}{3^2 \times 3^3 \times 2^7}$

(o) $\frac{4^{10}}{(2^3)^2 \times 2^4}$

(p) $\frac{4^7 \times 3^4}{4^3 \times 6^4}$

(q) $\frac{5^3 \times 2^5 \times 3^3}{2^2}$

(r) $\left(\frac{3}{2}\right)^5 \times \frac{6^5}{3^2}$

3. Use a calculator to verify the following.

(a) $(-7)^3 \times (-7)^2 = (-7)^5$

(b) $\frac{(-3)^6}{(-3)^4} = (-3)^2$

(c) $[(-5)^2]^3 = (-5)^6$

(d) $(-3)^4 \times (-5)^4 = [(-3) \times (-5)]^4$

(e) $\frac{(-2)^3}{(-7)^3} = \left(\frac{-2}{-7}\right)^3$

4. (a) Write the value of $\left(\frac{2}{3}\right)^4$ as a fraction.

(b) Simplify $\left(\frac{2}{3}\right)^6 \times \left(\frac{2}{3}\right)^{10}$ as a power of $\frac{2}{3}$.

ANSWERS

Exercise 1.1 (p. 6)

1. (a) 11^7 (b) 5^3 (c) 18^{12}
(d) 6^7 (e) 7^2 (f) 13^{12}
(g) 2^{13} (h) 2^4 (i) 7^{25}
(j) 5^{15} (k) 5^3 (l) 5^{24}
(m) $7^6 \times 11^7$ (n) $\frac{11^2}{5^5}$ (o) $\frac{3^{11}}{2^9}$
(p) $17^5 \times 11^9$ (q) $\frac{17^2}{7^7}$ (r) $7^7 \times 2$
2. (a) 12^3 (b) 7^2 (c) $\left(\frac{2}{3}\right)^3$
(d) 6^3 (e) 3^4 (f) $\left(\frac{5}{6}\right)^2$
(g) 6^3 (h) 3^3 (i) 6^6
(j) 2^2 (k) 6^2 (l) 6^4
(m) 6^5 (n) 3^2 (o) 2^{10}
(p) 2^4 (q) 30^3 (r) 3^8
4. (a) $\frac{16}{81}$ (b) $\left(\frac{2}{3}\right)^{16}$