

Exponents and Multiplication

Simplify. Your answer should contain only positive exponents.

$$1) 4^2 \cdot 4^2$$
$$4^4$$

$$2) 4 \cdot 4^2$$
$$4^3$$

$$3) 3^2 \cdot 3^2$$
$$3^4$$

$$4) 2 \cdot 2^2 \cdot 2^2$$
$$2^5$$

$$5) 2n^4 \cdot 5n^4$$
$$10n^8$$

$$6) 6r \cdot 5r^2$$
$$30r^3$$

$$7) 2n^4 \cdot 6n^4$$
$$12n^8$$

$$8) 6k^2 \cdot k$$
$$6k^3$$

$$9) 5b^2 \cdot 8b$$
$$40b^3$$

$$10) 4x^2 \cdot 3x$$
$$12x^3$$

$$11) 6x \cdot 2x^2$$
$$12x^3$$

$$12) 6x \cdot 6x^3$$
$$36x^4$$

$$13) \frac{7v^3 \cdot 10u^3v^5 \cdot 8uv^3}{560v^{11}u^4}$$

$$14) \frac{9xy^2 \cdot 9x^5y^2}{81x^6y^4}$$

$$15) \frac{6m^3n^3 \cdot 8m^2n^3}{48m^5n^6}$$

$$16) \frac{6x^2 \cdot 6x^3y^4}{36x^5y^4}$$

$$17) \frac{7u^2v^5 \cdot 9uv^3}{63u^3v^8}$$

$$18) \frac{uv \cdot 4uv^5}{4u^2v^6}$$

$$19) \frac{10xy^3 \cdot 8x^5y^3}{80x^6y^6}$$

$$20) \frac{3u^4v^5 \cdot 7u^2v^3}{21u^6v^8}$$

$$21) \frac{(2x^2)^2}{4x^4}$$

$$22) \frac{(p^4)^4}{p^{16}}$$

$$23) \frac{(k^3)^4}{k^{12}}$$

$$24) \frac{(7k)^2}{49k^2}$$

$$25) \frac{(x^2)^3}{x^6}$$

$$26) \frac{(2b^2)^4}{16b^8}$$

Exponents and Division

Simplify. Your answer should contain only positive exponents.

$$1) \frac{5^4}{5^3}$$

$$2) \frac{3}{3^3}$$
$$\frac{1}{3^2}$$

$$3) \frac{2^2}{2^3}$$
$$\frac{1}{2}$$

$$4) \frac{2^4}{2^2}$$
$$2^2$$

$$5) \frac{3r^3}{2r}$$
$$\frac{3r^2}{2}$$

$$6) \frac{7k^2}{4k^3}$$
$$\frac{7}{4k}$$

$$7) \frac{10p^4}{6p}$$
$$\frac{5p^3}{3}$$

$$8) \frac{3b}{10b^3}$$
$$\frac{3}{10b^2}$$

$$9) \frac{8m^3}{10m^3}$$
$$\frac{4}{5}$$

$$10) \frac{7n^3}{2n^5}$$
$$\frac{7}{2n^2}$$

$$11) \frac{2n^2}{n}$$
$$2n$$

$$12) \frac{8x^3}{10x^5}$$
$$\frac{4}{5x^2}$$

$$13) \frac{12x^3}{9y^8}$$
$$\frac{4x^3}{3y^8}$$

$$14) \frac{14x^4y^7}{6x^5y^4}$$
$$\frac{7y^3}{3x}$$

$$15) \frac{11u^4}{17u^7v^9}$$
$$\frac{11}{17u^3v^9}$$

$$16) \frac{4y^4}{14yx^8}$$
$$\frac{2y^3}{7x^8}$$

$$17) \frac{12yx^4}{10yx^8}$$
$$\frac{6}{5x^4}$$

$$18) \frac{18x^8y^8}{10x^3}$$
$$\frac{9x^5y^8}{5}$$

$$19) \frac{5n^8}{20n^8}$$
$$\frac{1}{4}$$

$$20) \frac{16yx^4}{9x^8y^2}$$
$$\frac{16}{9x^4y}$$

Powers of Products and Quotients

Simplify. Your answer should contain only positive exponents.

1) $(3a^2)^3$
 $27a^6$

2) $(2n^4)^4$
 $16n^{16}$

3) $(3x^4)^4$
 $81x^{16}$

4) $(6b^2)^2$
 $36b^4$

5) $(7y^4)^2$
 $49y^8$

6) $(3ab^4)^4$
 $81a^4b^{16}$

7) $(2x^4y^4)^3$
 $8x^{12}y^{12}$

8) $(5mn^3)^3$
 $125m^3n^9$

9) $(x^2y^2)^2$
 x^4y^4

10) $(6yx^4)^2$
 $36y^2x^8$

11) $(u^4v^3)^2$
 u^8v^6

12) $(2x^4y^4)^4$
 $16x^{16}y^{16}$

13) $(3x^2 \cdot 2x^2)^2$
 $36x^8$

14) $(2p^3 \cdot 2p)^2$
 $16p^8$

15) $(4n^3 \cdot n^2)^2$
 $16n^{10}$

16) $(3x \cdot 2x)^2$
 $36x^4$

17) $(4x^4 \cdot x^4)^3$
 $64x^{24}$

18) $(4n^4 \cdot n)^2$
 $16n^{10}$

Square Roots

Find each square root.

1) $\sqrt{64}$
8

2) $\sqrt{36}$
6

3) $\sqrt{49}$
7

4) $\sqrt{0}$
0

5) $\sqrt{25}$
5

6) $\sqrt{1}$
1

7) $\sqrt{9}$
3

8) $\sqrt{4}$
2

Find each square root. Round to the nearest whole number.

9) $-\sqrt{200}$
-14

10) $\sqrt{144}$
12

11) $-\sqrt{80}$
-9

12) $-\sqrt{34}$
-6

13) $-\sqrt{127}$
-11

14) $\sqrt{1}$
1

15) $-\sqrt{36}$
-6

16) $-\sqrt{148}$
-12

Find each square root.

17) $-\sqrt{\frac{1}{4}}$
 $-\frac{1}{2}$

18) $\sqrt{\frac{81}{121}}$
 $\frac{9}{11}$

19) $\sqrt{\frac{49}{196}}$
 $\frac{1}{2}$

20) $\sqrt{\frac{81}{49}}$
 $1\frac{2}{7}$

21) $-\sqrt{\frac{25}{196}}$
 $-\frac{5}{14}$

22) $-\sqrt{\frac{196}{225}}$
 $-\frac{14}{15}$