

## Self-Check 20 Exponents: Meaning and Laws

Simplify each of the following

1.  $3^4 \cdot 3^2$

3.  $(7x + 5y)^2$

5.  $(-4xy^2)^3$

7.  $(x^3y^2)(xy^3)^3$

9.  $\frac{xy^9}{3y^{12}} \cdot \frac{-21y}{7x^5}$

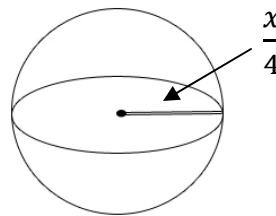
2.  $2a^2 + 3b^2$

4.  $(2x^2)^5 + (5y)^5$

6.  $(2^{-1} \cdot 4^{-1})^{-1}$

8.  $\frac{15x^6y}{3xy}$

10. The formula for the volume of a sphere is  $V = \frac{4}{3}\pi r^3$ . What is the volume of this sphere?



## Solutions to Self-Check 20 Exponents: Meaning and Laws

Simplify each of the following

1.  $3^4 \cdot 3^2 = 3^6 = 729$

3.  $(7x + 5y)^2 = (7x + 5y)(7x + 5y) = 49x^2 + 70xy + 25y^2$

5.  $(-4xy^2)^3 = -64x^3y^6$

7.  $(x^3y^2)(xy^3)^3 = x^6y^{11}$

9.  $\frac{xy^9}{3y^{12}} \cdot \frac{-21y}{7x^5} = \frac{-1}{x^4y^2}$

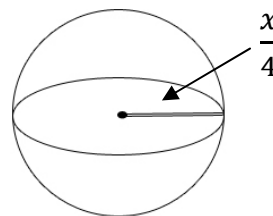
2.  $2a^2 + 3b^2 = 2a^2 + 3b^2$

4.  $(2x^2)^5 + (5y)^5 = 32x^{10} + 3125y^5$

6.  $(2^{-1} \cdot 4^{-1})^{-1} = 8$

8.  $\frac{15x^6y}{3xy} = 5x^5$

10. The formula for the volume of a sphere is  $V = \frac{4}{3}\pi r^3$ . What is the volume of this sphere?



$$\begin{aligned} \text{If } r = \frac{x}{4}, \text{ then } V &= \frac{4}{3}\pi \left(\frac{x}{4}\right)^3 \\ &= \frac{4}{3}\pi \left(\frac{x^3}{4^3}\right) \\ &= \frac{4}{3}\pi \left(\frac{x^3}{64}\right) = \frac{\pi x^3}{48} \end{aligned}$$