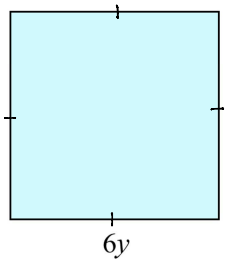
Multiplying and Dividing Monomials

What are two ways to represent the perimeter of the square?

$6y + 6y + 6y + 6y$ or $4 \cdot 6y$

$= 24y$



What are two ways to represent the area of the square?

$6y \cdot 6y$ or $(6y)^2$

$= 36y^2$

Example: Multiply each pair of monomials.

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

$= 6 \cdot x \cdot x$

b) $(3x)(-2x) = -6x^2$

c) $(3x)(2y) = 6xy$

$= 6 \cdot x \cdot y$

Practise: Multiply each pair of monomials.

a) $(4x)(2x) = 8x^2$

b) $(-3x)(5x) = -15x^2$

c) $(5y)(4x) = 20yx$

$= 20xy$

Example: Divide each pair of monomials.

a) $(8x^2) \div (4x) = 2x$

b) $\frac{-4xy}{2y} = -2x$

c) $\frac{12m^2n}{-3m} = -4mn$

$\frac{12 \cdot m \cdot m \cdot n}{-3 \cdot m}$

Practise: Divide each pair of monomials.

a) $(6x^2) \div (-2x) = -3x$

b) $\frac{10xy}{5y} = 2x$

c) $\frac{-12xy}{-3x} = 4y$

The area of a rectangle is given by the expression $15x^2$. The width of the rectangle is represented by $3x$. What is the length of the rectangle in terms of x?

Area = length • width

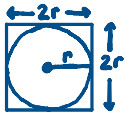
$15x^2 = \text{length} \cdot 3x \rightarrow \text{length} = \frac{15x^2}{3x} = 5x$

The length is 5x.

Crackers are often packaged by stacking them in boxes shaped as square-based prisms. The volume of one cracker is given as $\pi r^2 h$, where r is the radius of the cracker and h is its height. The volume of the box is given as $4r^2hn$, where n is the number of crackers it can hold.

a) What does $\frac{4r^2hn}{hn}$ equal? What does it represent?

$\frac{4r^2\cancel{hn}}{\cancel{hn}} = 4r^2$ ← represents the area of the base of the box



Area = $2r \cdot 2r = 4r^2$

b) What does $\frac{\pi r^2 h}{4r^2hn}$ equal? What does it represent?

$\frac{\pi\cancel{r^2}\cancel{h}}{4\cancel{r^2}\cancel{hn}} = \frac{\pi}{4n}$ ← represents the fraction of space in the box taken by one cracker.

$\frac{\text{volume of one cracker}}{\text{volume of the box}}$

Assignment: p. ~~258~~ 260 #7 – 10, 15 – 19, 22