Unit 4 - Using Equations to Solve Word Problems

Working with formulas Section 7.9 Pages 368-370	What is a formula? Common Formulas (**Area, Volume**) Rewriting formulas to isolate one variable (get **x** by itself) **Classwork: P369** - 1, 2 , 3, 4, 9, 10, 12 **Homework: Pg369** - 5, 6, 7, 8, 11, 13, 14

Notes:

A MATHEMATICAL RULE OR RELATIONSHIP EXPRESSED WITH LETTERS OR SYMBOLS.

$A = lw \quad V = lwh \quad n_1 \sin\theta_i = n_2 \sin\theta_R$

Classwork: Pg. 369

1. For the formula $A = lw$,

a) find A if $l = 8$ cm and $w = 5$ cm

$A = lw$

$= (8\text{ cm})(5\text{ cm})$

$= 40\text{ cm}^2$

$A = lw$

$w = \frac{A}{l}$

$= \frac{40\text{ m}^2}{10\text{ m}}$

$= 4\text{ m}$

c) find l if $A = 238\text{ m}^2$ and $w = 14$ m

$A = lw$

$l = \frac{A}{w}$

$= \frac{238}{14}$

$= 17\text{ m}$

2) Assume $\pi = 3.14$. For the formula $C = 2\pi r$,

a) find C if $r = 10$ cm

$C = 2\pi r$

$= 2(3.14)(10)$

$= 2(31.4)$

$= 62.8$ cm

b) find r if $C = 628$ cm

$C = 2(\pi r)$

$\rightarrow \frac{C}{2} = \pi r$

$\frac{C/2}{\pi} = r$

$r = \frac{C/2}{\pi}$

$= \frac{628/2}{3.14}$

$= \frac{314}{3.14}$

$\rightarrow 100$ cm

3) For the formula $A = \frac{1}{2}bh$,

a) find A if $b = 6$ cm and $h = 8$ cm

$A = \frac{1}{2}bh$

$= \frac{1}{2}(6)(8)$

$= 24$ cm^2

b) find h if $A = 40$ cm^2 and $b = 4$ cm

$A = \frac{1}{2}bh$

$A = 0.5bh$

$2A = bh$

$\frac{2A}{b} = h$

$\frac{2(40)}{4} = h$

$\rightarrow 20$ cm

c) find b if $A = 61.5$ m^2 and $h = 20.5$ m

$A = \frac{1}{2}bh$

$2A = bh$

$\frac{2A}{h} = b$

$\frac{2(61.5)}{20.5}$

$\rightarrow 6$ m

4. For the formula $P = 2(l + w)$,

a) find P if $l = 9$ m and $w = 6$ m

$P = 2(l+w)$

$= 2(9+6)$

$= 30$ m

b) find w if $P = 60$ m and $l = 16$ m

$P = 2(l+w)$

$P/2 = (l+w)$

$P/2 - l = w$

$60/2 - 16 = w$

$\rightarrow 14$ m

Solve each formula for the indicated variable.

9. $E = mc^2$ for m

$m = \frac{E}{c^2}$

10. $A = \frac{1}{2}h(a+b)$ for b

$A = \frac{1}{2}h(a+b)$

$2A = h(a+b)$

$\frac{2A}{h} = a+b$

$\frac{2A}{h} - a = b$

$\therefore b = \frac{2A}{h} - a$

12. **Water resistance** Whales, sharks, and dolphins have shapes that minimize water resistance. The ideal shape for minimum water resistance is a torpedo shape, with a width that is one quarter of the length. The following equations show how the width, w, of a blue whale, a shark, or a dolphin is related to its length, l.

Blue Whale	$w = 0.21l$
Shark	$w = 0.26l$
Dolphin	$w = 0.25l$

a) About how wide is a shark that is 18 m long?

b) The blue whale is the world's largest mammal. Is a 30-m long blue whale wider than your classroom?

a) $l = 18$ m

$w = 0.26l$

$= 0.26(18)$

$= 4.68$ m

b) $l = 30$ m

$w = 0.21l$

$= 0.21(30)$

$\rightarrow 6.3$ m

NO.