

4.4 – Modeling With Formulas Worksheet

MPM1D

1. Rearrange each formula to isolate the variable indicated.

a) $P = 4s$ for s

b) $A = P + I$ for P

c) $C = 2\pi r$ for r

c) $y = mx + b$ for b

2. Rearrange each formula to isolate the variable indicated.

a) $d = mt + b$ for m

b) $P = 2l + 2w$ for w

c) $a = \frac{v}{t}$ for v

d) $v = \frac{d}{t}$ for t

e) $A = \pi r^2$ for r

f) $P = I^2 R$ for I

3. You can use the formula $C = 2.5I$ to obtain an approximate value for converting a length, I , in inches to a length, C , in centimetres.

a) Use the formula to find the number of centimetres in

i) 6 inches

ii) 3 feet (1 foot = 12 inches)

b) Rearrange the formula to express I in terms of C .

c) How many inches are in

i) 75 cm

ii) 1 m

4. Kwok is a hotel manager. His responsibilities include renting rooms for conferences. The hotel charges \$250 per day plus \$15 per person for the grand ballroom.

a) Create a formula that relates the cost, C , in dollars, of renting the ballroom to the number of people, n .

b) How much should Kwok charge to rent the hall for:

i) 50 people

ii) 100 people

c) Rearrange your formula to express n in terms of C .

d) How many people could attend a wedding reception if the wedding planners have a budget of:

i) \$4000

ii) \$2000

5. The area, A , of a square is related to its perimeter, P , by the formula $A = \frac{P^2}{16}$

a) Rearrange this formula to express P in terms of A .

b) Find the perimeter of a square with area:

i) 25 cm^2

ii) 50 cm^2

6. Sometimes the same formula can have many different forms. $PV = nRT$ is a useful formula in chemistry. It relates the characteristics of a gas:

Variable	Characteristic
P	pressure
V	volume
R	universal gas constant
n	number of moles, or how much gas there is
T	temperature

Rearrange this formula to isolate each variable:

7. The distance an accelerating object travels is related to its initial speed, v , its rate of acceleration, a , and time, t :

$$d = vt + \frac{1}{2}at^2$$

a) Rearrange this formula to isolate v .

b) An object travels 30 m while accelerating at a rate of 6 m/s² for 3 seconds. What was its initial speed?