

Practise: Model with Formulas

1. Rearrange each formula to isolate the indicated variable.

a) $I = Prt$ for t

$$t = \frac{I}{Pr}$$

b) $PV = nRT$ for V

$$V = \frac{nRT}{P}$$

c) $d = vt + \frac{1}{2}at^2$ for a

d) $y = mx + b$ for m

$$m = \frac{y-b}{x}$$

2. a) Rearrange the formula
- $I = Prt$
- to isolate
- P
- .

$$P = \frac{I}{rt}$$

- b) Rearrange the formula
- $I = Prt$
- to isolate
- r
- .

$$r = \frac{I}{Pt}$$

- c) Rearrange the formula
- $I = Prt$
- to isolate
- t
- .

$$t = \frac{I}{Pr}$$

Use the rearranged formulas from question 5 to complete the table.

Interest (\$)	Principal (\$)	rate (%)	time (years)
500	2000	6.25	4
66	600	5.5%	2
120	1200	4%	2.5
450	1000	5%	9

Hint: Before using a percent in a formula, convert it to a decimal.

3. a) Rearrange the formula
- $d = vt$
- to isolate
- v
- .

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

$$d = vt$$

- b) Rearrange the formula
- $d = vt$
- to isolate
- t
- .

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

- c) Use your rearranged formulas to fill in the table.

distance (m)	time (s)	velocity (m/s)
4	3	1.3
6	3	2
60	5	15
28	7	4
121	11	11
85	5	17

$$d = vt$$

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

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

$$d = vt$$

Practise: Convert Linear Equations From Standard Form

1. The linear equations are written in standard form. List the steps needed to rearrange each equation into slope
- y
- intercept form.

a) $x + y - 3 = 0$

$$y = -x + 3$$

b) $-12x - 4y - 8 = 0$

$$-4y = 12x + 8$$

$$y = -3x - 2$$

c) $-3x + 5y - 15 = 0$

$$5y = +3x + 15$$

$$y = \frac{3}{5}x + 3$$

d) $8x - 2y + 11 = 0$

$$-2y = -8x - 11$$

$$y = 4x + \frac{11}{2}$$

2. Write each equation in slope
- y
- intercept form. Then, state its slope and
- y
- intercept.

a) $3x + y - 5 = 0$

$$y = -3x + 5$$

$$m = -3$$

$$b = 5$$

b) $-x + y = 0$

$$y = x$$

$$m = 1$$

$$b = 0$$

c) $y - 4 = 0$

$$y = 4$$

$$m = 0$$

$$b = 4$$

d) $-2x + 5y - 15 = 0$

$$5y = 2x + 15$$

$$y = \frac{2}{5}x + 3$$

$$m = \frac{2}{5}$$

$$b = 3$$

3. Verify your answers in question 2 using a CAS.

4. The line
- $2x + 5y + C = 0$
- goes through the point (1, 7). Find the value of
- C
- .

$$2(1) + 5(7) + C = 0$$

$$2 + 35 + C = 0$$

$$37 + C = 0$$

$$C = -37$$



 Section
4.4

5. The line $Ax - 2y + 4 = 0$ goes through the point $(1, 3)$. Find the value of A .

$$A(1) - 2(3) + 4 = 0$$

$$A = 6 - 4 = 2$$

6. The line $y = mx - 7$ goes through the point $(3, 5)$. Find the value of m .

$$5 = m(3) - 7$$

$$12 = 3m \quad \nearrow \quad 3m = 12$$

$$m = 4$$

7. Wembley banquet hall charges a flat fee of \$2000 for a rental, and a per-person fee of \$42.

- a) Write a linear equation to model the total cost in dollars (C) of holding a banquet for n people.

$$C = 42n + 2000$$

- b) How much did it cost to hold a banquet for 250 people?

$$C = 42(250) + 2000 = 10500 + 2000$$

$$= 12500$$

8. Chisholm banquet hall charges a flat fee of \$2500 and a per-person fee of \$44.

- a) Write a linear equation to model the cost in dollars (C) of holding a banquet for n people.

$$C = 44n + 2500$$

- b) How much will it cost to hold a banquet for 250 people?

$$C = 44(250) + 2500$$

$$C = 11000 + 2500 = \$13500$$

- c) How does the total cost of a banquet for 250 people at Chisholm Hall compare to the total cost of a banquet for 250 people at Wembley Hall?

\$ Difference