## 8.1 Solving Equations
$$ax = b, \quad \frac{x}{a} = b, \quad \frac{a}{x} = b$$

### Ex 1 – Fractions

Steps
C()?
Like terms?
v = v ?
Constant?
Coefficient=1?
Check

a) $\frac{2x}{2} = \frac{3}{4} \div \frac{2}{1}$

$x = \frac{3}{4} \times \frac{1}{2}$

$x = \frac{3}{8}$

Check:
$2x = \frac{3}{4}$

$2\left(\frac{3}{8}\right) = \frac{3}{4}$

$\frac{6}{8} = \frac{3}{4}$

$\frac{3}{4} = \frac{3}{4} \checkmark$

b) $\frac{1}{3} \times \frac{m}{3} = -\frac{2}{5} \times \frac{3}{1}$

$\frac{3}{5}m$

$m = \frac{-6}{5}$ or $-1\frac{1}{5}$

$\frac{m}{3} = \frac{-2}{5}$

$\frac{-6}{5} \div \frac{3}{1} = \frac{-2}{5}$

$\frac{-6}{5} \times \frac{1}{3} = \frac{-2}{5}$

$\div 3 \quad \frac{-6}{15} = \frac{-2}{5}$

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

c) $-2\frac{1}{2}k = -3\frac{1}{2}$

$2\left[\frac{-5}{2}k = \frac{-7}{2}\right]2$

$\frac{-5k}{-5} = \frac{-7}{-5}$

$k = \frac{7}{5}$

$-2\frac{1}{2}k = -3\frac{1}{2}$

$-2.5\left(\frac{7}{5}\right) = -3.5$

$-3.5 = -3.5$

SYK:

a) $3x = \frac{-2}{3}$

b) $\frac{x}{2} = \frac{5}{6}$

c) $-1\frac{1}{4}y = 1\frac{3}{4}$

### Ex 2 – Decimals

Steps
C()?
Like terms?
v = v?
Constant?
Coefficient=1?
Check.

a) $\frac{-1.2x}{-1.2} = \frac{-3.96}{-1.2}$

$x = 3.3$

$-1.2x = -3.96$
$-1.2(3.3) = -3.96$
$-3.96 = -3.96$

b) $0.28 \quad \frac{1r}{T} = -4.5 \times 0.28$

$0.28$

$r = -1.26$

$\frac{r}{0.28} = -4.5$

$\frac{-1.26}{0.28} = -4.5$

$-4.5 = -4.5$

SYK2  a) $\frac{u}{1.3} = 0.8$

b) $5.5k = -3.41$

### Ex 3: Form $\frac{a}{x} = b$

The formula for distance is $s = d/t$,
where s is the speed, d is distance and
t is time.
The length of a football field is 137.2 m.
If a horse gallops at a speed of 13.4 m/sec = $\frac{m}{s}$
how much time will it take to gallop across $= \frac{d}{t}$
the field?

$s = 13.4 \, m/s$
$d = 137.2 m$
$t = ?$

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

$t\left[13.4 = \frac{137.2}{t}\right]t$

$13.4t = 137.2 \quad \left(t = \frac{d}{s}\right)$

$\frac{13.4t}{13.4} = \frac{137.2}{13.4}$

$t = 10.2$



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

$d = s \cdot t$

$13.4 = \frac{137.2}{10.2}$

$13.4 = 13.5$

SYK3  $s = \frac{d}{t}$
$s = 23.5 \, km/h$
$d = 50 \, km$
$t = ?$

Ex 4: Write and Solve Equations

Winterwarehouse has jackets on sale at 25% off the regular price. If a jacket was on sale for $176.25, what was the original cost of the jacket?

25% off means you are paying 75% of the jacket

$0.75 \times$ regular price of jacket = what you're paying.

$$0.75r = 176.25$$
$$\frac{0.75r}{0.75} = \frac{176.25}{0.75}$$
$$r = 235$$

The regular price was $235.

$$0.75r = 176.25$$
$$0.75(235) = 176.25$$
$$176.25 = 176.25$$

SYK 4

Sale is 30% off regular price. Mittens are $34.99 on sale. What is the regular price?