

Solving multi-step equations

Idea: collect like terms and isolate for variable

eg $\underline{4x} - \underline{7x} = 18$

$$-3x = 18$$

$$x = \frac{18}{-3} = \boxed{-6}$$

eg $\underline{3a} + 5 - \underline{a} = 17$

$$2a = 12$$

$$a = \boxed{6}$$

common mistake:

$$3a + 5 - a = 4a + 5$$

$$+5 = 17 \Rightarrow \dots = 17 + 5$$

eg $7t + 8 = 4t + 12$

$$\begin{array}{r} -4t \\ -8 \end{array}$$

$$3t = 4$$

$$t = \boxed{\frac{4}{3}}$$

$$8 = -3t + 12$$

$$-4 = -3t$$

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

eg $3(\underline{y+3}) + 2(\underline{2y+5}) = 8y + 2$

$$3y + 9 + 4y + 10 = 8y + 2$$

$$\boxed{17} = y$$

eg $2(\underline{b-4}) - \underline{7(3b-1)} = 5$

$$2b - 8 - 21b + 7 = 5$$

$$-19b = 6$$

$$b = \boxed{-\frac{6}{19}}$$

common mistake:

$$-7(3b-1)$$

$$= -21b - 7$$

eg $3(x+2) - 2(2x+4) = 6-x$

$$3x + 6 - 4x - 8 = 6 - x$$

$$\cancel{-x} - 2 = 6 - \cancel{x}$$

No solution

eg $3(x+1) - 4(x+3) = 2x - (x+9)$

$$3x+3 - 4x-12 = 2x-x-9$$

$$-x - 9 = -x - 9$$

All x work