

Worksheet 1: Basic equation solving skills

When you solve equations on paper after playing DragonBox it is important to remember:

1. When you solve an equation on paper, you have to use one new line for every step in the calculation.
2. If you want to add, subtract, multiply or divide on one side of the equation, you have to remember to do the same on the other side.

Example:

1)



1)

$$x + b = c$$

2)



2)

$$x + b + (-b) = c + (-b)$$

3)



3)

$$x + 0 = c + (-b)$$

$$x = c + (-b)$$

Example:

1)



1)

$$a \cdot x = c$$

2)



2)

$$\frac{a \cdot x}{a} = \frac{c}{a}$$

3)



3)

$$\frac{a \cdot x}{a} = \frac{c}{a}$$

4)



$$1 \cdot x = \frac{c}{a}$$

$$x = \frac{c}{a}$$

1:



$$= x$$

a)

$$x + 2 = c$$

b) $x + a = b$

c) $x + d = 3$

2:



$$= y$$

a)

$$d + y + (-a) = (-c) + d$$

b)

$$b + y + (-c) = (-a) + b$$

c)

$$2 + y + (-a) = (-b) + 2$$

3:



$$= x$$

a)

$$a \cdot x = b$$

b)

$$c \cdot x = a + (-b)$$

c)

$$a \cdot (-d) \cdot x = (-c) + b$$

4:



$$= \mathbf{x}$$

a) $\frac{x}{a} = c$

b) $\frac{x}{2} = a + (-b)$

c) $\frac{x}{a \cdot (-d)} = (-c) + b$

5:



$$= \mathbf{x}$$

a) $a \cdot x + b = c$

b) $a = d \cdot x + (-c)$

c) $(-a) \cdot y + (-c) = b + (-d)$

Worksheet 2: Basic equation solving skills 2

1:  = b

a) $\frac{a \cdot x}{b} = d$

b) $\frac{x}{b} = a$

c) $\frac{(-c) \cdot b}{a} = y$

2:  = z

a) $c \cdot z + d = a$

b) $\frac{a}{z} = \frac{b}{c}$

c) $\frac{z \cdot x}{(-b)} + c = d$

3:



= z

a) $\frac{x \cdot z}{a} + b = c$

b) $\frac{a}{z} + \frac{b}{z} = c$

c) $\frac{2}{z} + \frac{2}{z} = a$

Worksheet 3: Numbering factoring and signs

1:  = x

a) $\frac{6 \cdot x}{3} = a$

b) $\frac{81 \cdot x}{9} = b$

c) $\frac{28 \cdot x}{64 \cdot 7} = a$

2:  = x

a) $\frac{x}{(-1)} = a$

b) $\frac{6 \cdot x}{(-6)} = a$

c) $\frac{(-1) \cdot x}{5} = a$

3:



= x

a) $(-1) \cdot x = a$

b) $(-1) \cdot (-1) \cdot x = a$

c) $(-x) = a$

4:



= x

a) $(-a) \cdot (-x) = b$

b) $(-a) \cdot x = b$

c) $a \cdot (-x) = b$

Worksheet 4: Parenthesis and distributive properties

1:  = x

a) $(x) = a$

b) $((x)) = a$

c) $\left(\left(\frac{a \cdot x}{b}\right)\right) = c$

2:  = x

a) $(a \cdot x + b) + c = d$

b) $(a \cdot x + b) + (c \cdot x + d) = e$

c) $((a \cdot x + b) + (c \cdot x + d)) + ((e)) = e$

3:



= x

a) $i \cdot (a \cdot x + b) = e$

b) $2 \cdot (a \cdot x + b) = \frac{(-e)}{((e))}$

c) $2 \cdot \left(a \cdot x + \frac{b}{4}\right) = \frac{(-e)}{e}$

4:



= x

a) $\frac{2}{3} \cdot \left(\frac{a \cdot x}{2} + b\right) = \frac{(-e)}{((-1) \cdot (e))}$

b) $\frac{2 \cdot (a \cdot x + b)}{5} = \frac{(-e)}{((e))}$

c) $\frac{(2 \cdot x + b)}{2} + (-a) = e$

5:



= x

a) $(-1) \cdot (a \cdot x + b) = e$

b) $(a \cdot x + b) \cdot (-2) = e$

c) $a \cdot (a \cdot x + b) \cdot (-3) = e$

Extra:

$$i \cdot \left(\frac{a \cdot x}{b} + \frac{c}{d} + (-b) \right) = \frac{i}{(-k)}$$

Worksheet 5: Summary

1:  = **x**

a) $a \cdot x + b = c \cdot x + d$

b) $c \cdot x + (-b) = a \cdot x + d$

2:  = **x**

a) $(a \cdot x + b) + (c \cdot x + d) = e$

b) $i \cdot (a \cdot x + b) + j \cdot (c \cdot x + d) = e$

c) $(a \cdot x + b) \cdot (c + d) = e$

3:



= x

$$\text{a) } \frac{a \cdot x}{b} + \frac{c}{d} = \frac{e \cdot x}{f} + \frac{g}{h}$$

$$\text{b) } i \cdot \left(\frac{a \cdot x}{b} + \frac{c}{d} \right) = j \cdot \left(\frac{e \cdot x}{f} + \frac{g}{h} \right)$$

4:



= x

$$\text{a) } \frac{a}{(x+b)} = c$$

$$\text{b) } \frac{a}{(x+b)} + \frac{c}{(x+d)} = \frac{e}{(x+d) \cdot (x+b)}$$

$$\text{c) } \frac{(ax+b) \cdot c}{(a \cdot d \cdot x + b \cdot d)} + \frac{(e \cdot x + f) \cdot g}{(a \cdot h \cdot x + b \cdot h)} = i$$

5:



= x

a)

$$\frac{(1-2x)}{3} + \frac{5x}{6} = 2 + \frac{(-3) \cdot (1-x)}{2}$$

b)

$$\frac{c \cdot (bx+a)}{(c \cdot e + c \cdot f)} + \frac{(3+a)}{(f+g)} = \frac{3 \cdot (jx+a)}{(c \cdot i + c \cdot f)} + \frac{(4+a)}{(f+k)}$$