



## Rearranging Formulae Teaching Ideas

**Learning Objective:** To change the subject of a formula by rearranging it.

**Success Criteria:**

- To change the subject of simple formulae.
- To change the subject of formulae involving fractions or powers.
- To apply factorisation when changing the subject of formulae.

**Context:** This lesson is designed to be a stand-alone lesson on Rearranging Formulae but it could be used in a sequence of lessons on the wider topic of algebra. Students should have been introduced to solving linear equations as many of the skills involved with solving can be transferred to rearranging formulae. Additionally, students should have a confident understanding of how to factorise into a single bracket.

### Starter

#### Function Machines

The starter on function machines should remind students of the importance of using inverse operations to find each starting number. This skill will later be involved when changing the subject of a formula.

You should encourage the students to give clear explanations of how they got to their answers. Students simply saying, 'I guessed' or 'I just knew' should be discouraged; you should emphasise the importance of mathematical reasoning and being able to explain methods confidently.

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### Main Activities

#### Rearranging Formulae

You may wish to introduce the concept of rearranging formulae and give students the general 'Steps to Remember' when changing the subject. You could talk through this slide and encourage students to copy down the steps. On the following slides, the students can see these steps in practice.

As a class, walk through the process of how to change the subject of a formula. The 'Steps to Remember' are pinned to the side to remind students. Each step can be revealed with a single click so you are able to work through the example at a pace which suits the needs of your class. Additionally, you should continually check for understanding of how and why something has moved. For example, "To cancel out the  $t$ , we must subtract it from both sides" could be linked to solving linear equations;  $t$  cancels out because if we apply its inverse, it will become 0. You may even wish to use whiteboards to work through the examples and ask the students to predict each step in the rearrangement.

The 5 practice questions give students the opportunity to apply what they have just seen. These can be done independently or you may wish to coach, where appropriate. Students should try to justify and explain their methods where necessary; encourage this by asking questions such as 'Why did you do that?' 'Why is that the correct answer?' 'Can you prove that your answer is correct?'

## Rearranging Formulae Involving Fractions or Powers

You may wish to use the next slides as a teacher-led walkthrough of changing the subject of formulae which involve fractions and powers. Alternatively, you may opt to display the question first and allow students time to discuss their ideas in pairs or small groups. The whole class could then be brought back together to reinforce understanding or address misconceptions or mistakes.

Again, there are 5 practice questions for the student to apply what they have seen.

## Rearranging Formulae Using Factorisation

This can be delivered in the same way as the previous activities. The additional steps to remember are pinned to the side to remind students. Each step can be revealed with a single click so, again, you are able to work through the examples at a pace which suits the needs of your class. Ensure you continually check for understanding, especially because the steps are trickier than before and can easily be done incorrectly. There are 3 additional practice questions.

Following these activities, there are a variety of independent activity sheets that could be used to help students consolidate their understanding. Sheets available include [Rearranging Formulae](#), [Rearranging Formulae \(Fractions or Powers\)](#) and [Rearranging Formulae \(Using Factorisation\)](#). If you prefer, you may wish to use alternative card sort activities: [Rearranging Formulae](#), [Rearranging Formulae \(Fractions or Powers\)](#) and [Rearranging Formulae \(Using Factorisation\)](#).

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## Plenary

The plenary encourages students to be reflective about their learning. The key leading questions are designed to give students a starting point to write their journal and is aimed at opening a dialogue between student and teacher about the student's learning. Students should be given 10-15 minutes on this activity to allow them enough time to really reflect on the lesson. You may wish to take this opportunity to open one-to-one verbal dialogues with students. A clear explanation of thoughts should be seen at this point; refrain from leading students to certain answers and encourage genuine, honest answers.

# Fractions and Powers **Answers**

1.  $a = \frac{2x}{bc}$

2.  $b = \sqrt{p}$

3.  $x = \sqrt{\frac{a}{3}}$

4.  $x = y^2$

5.  $d = \frac{a^2}{5}$

6.  $b = \sqrt{ar}$

7.  $x = w(s-4) - 1$

8.  $p = \frac{a}{2r}$

9.  $b = \sqrt{\frac{2x}{a}}$

10.  $x = t(k+2) + 4$

11.  $t = \frac{a}{s}$

12.  $y = \frac{t}{x}$

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# Fractions and Powers **Answers**

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# Rearranging Formulae Fractions and Powers

1) Make **a** the subject

$$x = \frac{abc}{2}$$

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2) Make **b** the subject

$$p = b^2$$

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3) Make **x** the subject

$$a = 3x^2$$

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4) Make **x** the subject

$$y = \sqrt{x}$$

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5) Make **d** the subject

$$a = \sqrt{5d}$$

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6) Make **b** the subject

$$a = \frac{b^2}{r}$$

---

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7) Make **x** the subject

$$w = \frac{x+1}{s-4}$$

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8) Make **p** the subject

$$r = \frac{a}{2p}$$

---

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9) Make **b** the subject

$$x = \frac{1}{2}ab^2$$

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10) Make **x** the subject

$$t = \frac{x-4}{k+2}$$

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11) Make **t** the subject

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

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12) Make **y** the subject

$$x = \frac{t}{y}$$

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# Rearranging Formulae Fractions and Powers

1) Make **a** the subject

$$x = \frac{abc}{2}$$

Hint 1: Move the 2

Hint 2: Move the bc

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2) Make **b** the subject

$$p = b^2$$

Hint: What's the inverse of squaring?

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3) Make **x** the subject

$$a = 3x^2$$

Hint 1: Move the 3

Hint 2: What's the inverse of squaring?

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4) Make **x** the subject

$$y = \sqrt{x}$$

Hint: What's the opposite of 'square-rooting'?

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5) Make **d** the subject

$$a = \sqrt{5d}$$

Hint 1: Move the square root first

Hint 2: Move the 5

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6) Make **b** the subject

$$a = \frac{b^2}{r}$$

Hint 1: Move the r

Hint 2: What's the opposite of squaring?

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7) Make  $x$  the subject

$$w = \frac{x+1}{s-4}$$

Hint 1: Move the  $s-4$

Hint 2: Move the 1

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8) Make  $p$  the subject

$$r = \frac{a}{2p}$$

Hint 1: Move the  $2p$

Hint 2: Move the  $r$  followed by the 2

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9) Make  $b$  the subject

$$x = \frac{1}{2}ab^2$$

Hint 1: Move the  $\frac{1}{2}$

Hint 2: Move the  $a$

Hint 3: What's the opposite of squaring?

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10) Make  $x$  the subject

$$t = \frac{x-4}{k+2}$$

Hint 1: Move the  $k+2$

Hint 2: Move the 4

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11) Make  $t$  the subject

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

Hint 1: Move the  $t$

Hint 2: Move the  $s$

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12) Make  $y$  the subject

$$x = \frac{t}{y}$$

Hint 1: Move the  $y$

Hint 2: Move the  $x$

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# Rearranging Formulae Fractions and Powers

1) Make **a** the subject

$$x = \frac{abc}{2}$$

Hint: Move the 2

---

---

2) Make **b** the subject

$$p = b^2$$

Hint: What's the inverse of squaring?

---

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3) Make **x** the subject

$$a = 3x^2$$

Hint: Move the 3

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4) Make **x** the subject

$$y = \sqrt{x}$$

Hint: What's the opposite of 'square-rooting'?

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5) Make **d** the subject

$$a = \sqrt{5d}$$

Hint: Move the square root first

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6) Make **b** the subject

$$a = \frac{b^2}{r}$$

Hint: Move the r

---

---

7) Make  $x$  the subject

$$w = \frac{x+1}{s-4}$$

Hint: Move the  $s-4$

---

---

8) Make  $p$  the subject

$$r = \frac{a}{2p}$$

Hint: Move the  $2p$

---

---

9) Make  $b$  the subject

$$x = \frac{1}{2}ab^2$$

Hint: Move the  $\frac{1}{2}$

---

---

10) Make  $x$  the subject

$$t = \frac{x-4}{k+2}$$

11) Make  $t$  the subject

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

Hint: Move the  $t$

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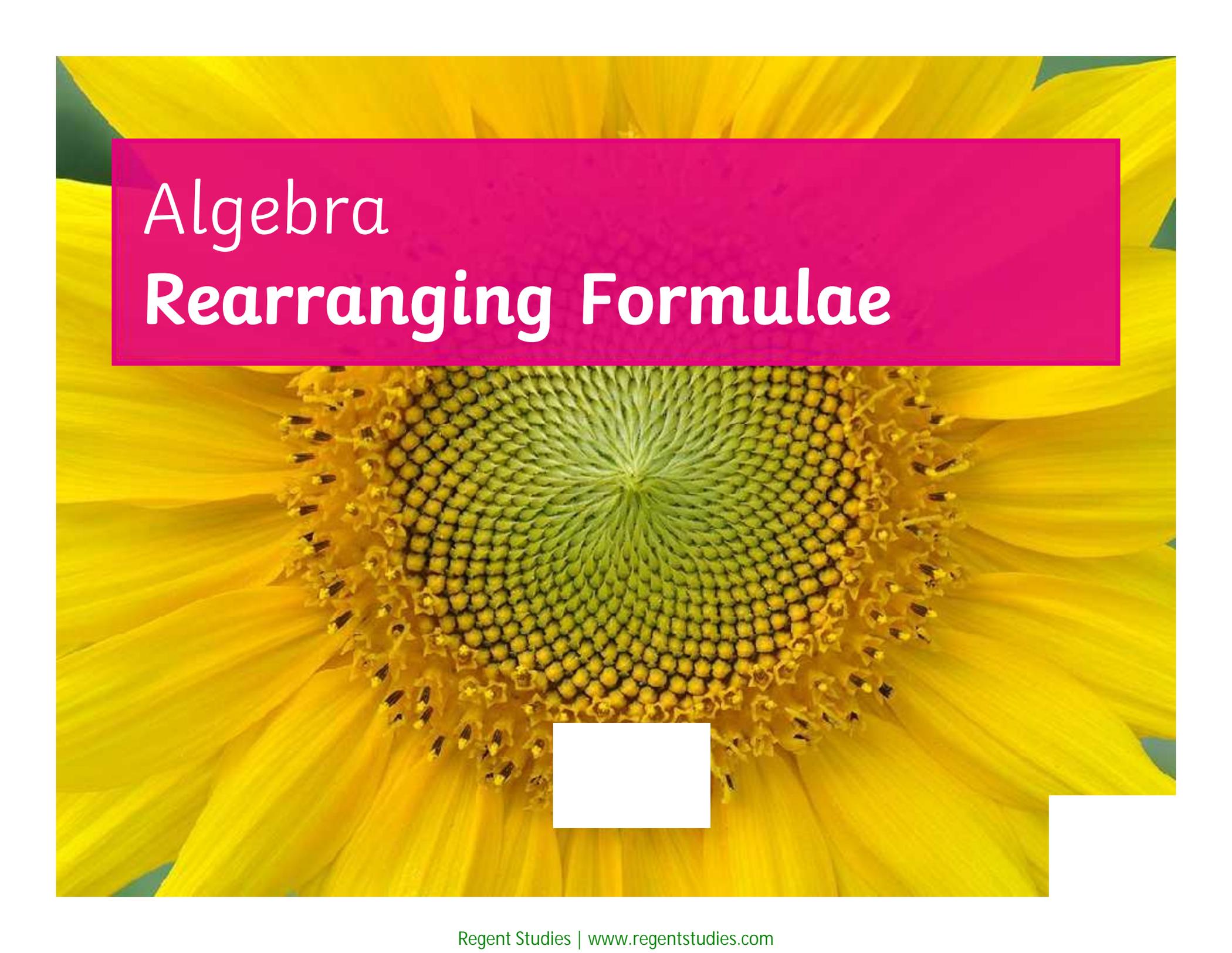
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12) Make  $y$  the subject

$$x = \frac{t}{y}$$

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A close-up photograph of a sunflower head, showing the intricate spiral pattern of the green and yellow florets in the center. The petals are a vibrant yellow. A semi-transparent pink rectangular box is overlaid on the upper portion of the image, containing the title text.

Algebra

# Rearranging Formulae

# Learning Objective

- To change the subject of a formula by rearranging it.

# Success Criteria

- To change the subject of simple formulae.
- To change the subject of formulae involving fractions or powers.
- To apply factorisation when changing the subject of formulae.

# Starter: Function Machines

For each of the following questions, can you identify its input?



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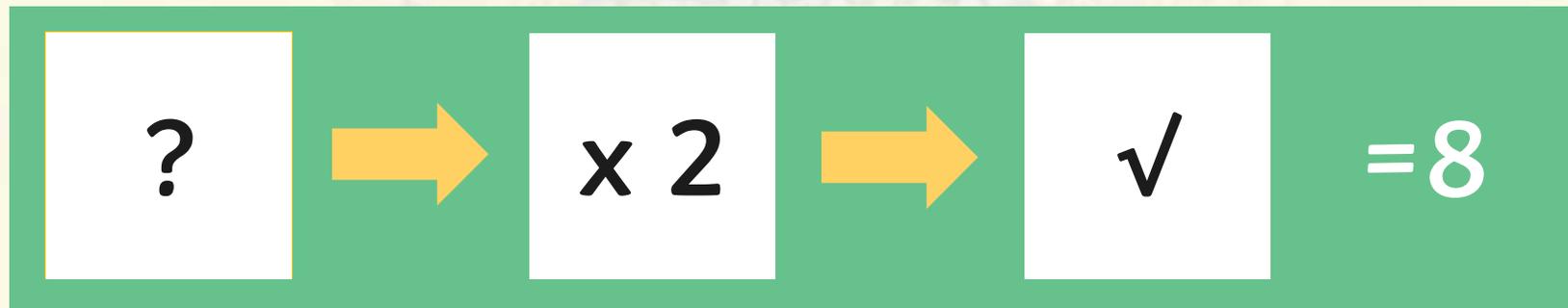
# Starter: Function Machines

For each of the following questions, can you identify its input?



# Starter: Function Machines

For each of the following questions, can you identify its input?



# Rearranging Formulae

Sometimes we need to rearrange a formula to find the value of a particular variable.

## Steps to Remember

1. Decide which part of the formula (which variable) needs to be the subject.
2. Identify what is preventing it from being on its own – which numbers or variables need to be cancelled out or moved?
3. One step at a time, separate out the required variable so it is by itself on one side of the equals.



# Rearranging Formulae



Make  $x$  the subject of this formula:

$$a = mx + t$$

To cancel out  $t$ , we must subtract it from both sides.  $a - t = mx$

To cancel out  $m$ , we must divide by  $m$  on both sides.  $\frac{a-t}{m} = x$

1. Decide which variable needs to be the subject.
2. Identify what is preventing it from being on its own – what needs to be moved?
3. One step at a time, separate out the required variable.

Final answer:  $x = \frac{a-t}{m}$

# Rearranging Formulae



Make  $x$  the subject of this formula:

$$x = 2(2x - a)$$

At the moment  $x$  isn't the subject, as there is an  $x$  on both sides. Start by expanding the bracket.

$$x = 4x - 2a$$

To cancel out  $2a$ , we must add it to both sides.

$$x + 2a = 4x$$

Next, collect the  $x$ s on one side.

$$2a = 3x$$

Now we need to separate 3 and  $x$ . To do this, we divide by 3.

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

1. Decide which variable needs to be the subject.
2. Identify what is preventing it from being on its own – what needs to be moved?
3. One step at a time, separate out the required variable.

**Final answer:**  $x = \frac{2a}{3}$

# Rearranging Formulae



Make  $x$  the subject of each formula:

1)  $ax = h$

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

2)  $x - 8 = a$

$$x = a + 8$$

3)  $3(x - a) = 2$

$$x = \frac{2 + 3a}{3}$$

4)  $2x + y = r$

$$x = \frac{r - y}{2}$$

5)  $5y = 2(8x + 2)$

$$x = \frac{5y - 4}{16}$$



# Involving Fractions or Powers



Make  $y$  the subject of this formula:

$$x = \frac{y}{4} + 6$$

To cancel out 6, we must subtract it from both sides.

$$x - 6 = \frac{y}{4}$$

Now we need to cancel out the fraction. To do this, we must multiply both sides by the denominator.

$$4(x - 6) = y$$

1. Decide which variable needs to be the subject.
2. Identify what is preventing it from being on its own – what needs to be moved?
3. One step at a time, separate out the required variable.

$$\text{Final answer: } y = 4(x - 6)$$

# Involving Fractions or Powers



Make  $t$  the subject of this formula:

$$a = 3t^2$$

You must cancel out the coefficient before you can cancel out the power. Start by dividing both sides by 3.

$$\frac{a}{3} = t^2$$

Now we need to cancel out the  $^2$ . To do this we need to square root both sides.

$$\sqrt{\frac{a}{3}} = t$$

1. Decide which variable needs to be the subject.
2. Identify what is preventing it from being on its own – what needs to be moved?
3. One step at a time, separate out the required variable.

**Final answer:**  $t = \sqrt{\frac{a}{3}}$

# Involving Fractions or Powers



Make  $x$  the subject of each formula:

1)  $a = x^2 - 5$

$$x = \sqrt{a + 5}$$

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

$$x = 4(a + 3)$$

3)  $2x^2 - h = y$

$$x = \sqrt{\frac{y + h}{2}}$$

4)  $y = \sqrt{x - 2}$

$$x = y^2 + 2$$

5)  $\frac{4x}{7} + 5 = b$

$$x = \frac{7(b - 5)}{4}$$



# Rearranging Formulae Using Factorisation



Make  $x$  the subject of this formula:

$$b = 2x + ax$$

There are two terms involving  $x$ .  
We need to factorise it to separate out the  $x$ .

$$b = x(2 + a)$$

Now we need to cancel out the part in brackets. Divide both sides by  $2 + a$ . You will form a fraction with  $2 + a$  as the denominator.

$$\frac{b}{2 + a} = x$$

1. Decide which variable needs to be the subject.
2. Rearrange your formula to gather the  $x$ s on one side.
3. Factorise the side with the  $x$ s on.
4. Move the bracket from the factorisation to the other side, forming a fraction with the bracket becoming the denominator.

**Final answer:**  $x = \frac{b}{2 + a}$

# Rearranging Formulae Using Factorisation



Make  $x$  the subject of this formula:

$$8x + a = bx$$

Gather the  $x$ s on one side.  $a = bx - 8x$

Now that the  $x$ s are all on one side, we need to factorise that side.  $a = x(b - 8)$

Now we need to cancel out the part in brackets. Divide both sides by  $b - 8$ . You will form a fraction with  $b - 8$  as the denominator.  $\frac{a}{b - 8} = x$

1. Decide which variable needs to be the subject.
2. Rearrange your formula to gather the  $x$ s on one side.
3. Factorise the side with the  $x$ s on.
4. Move the bracket from the factorisation to the other side, forming a fraction with the bracket becoming the denominator.

**Final answer:**  $x = \frac{a}{b - 8}$

# Involving Fractions or Powers



Make  $x$  the subject of each formula:

1)  $k = x - ax$

$$x = \frac{k}{1 - a}$$

2)  $ax - x = c$

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

3)  $a = x + \frac{cx}{e}$

$$x = \frac{ae}{1 + c}$$



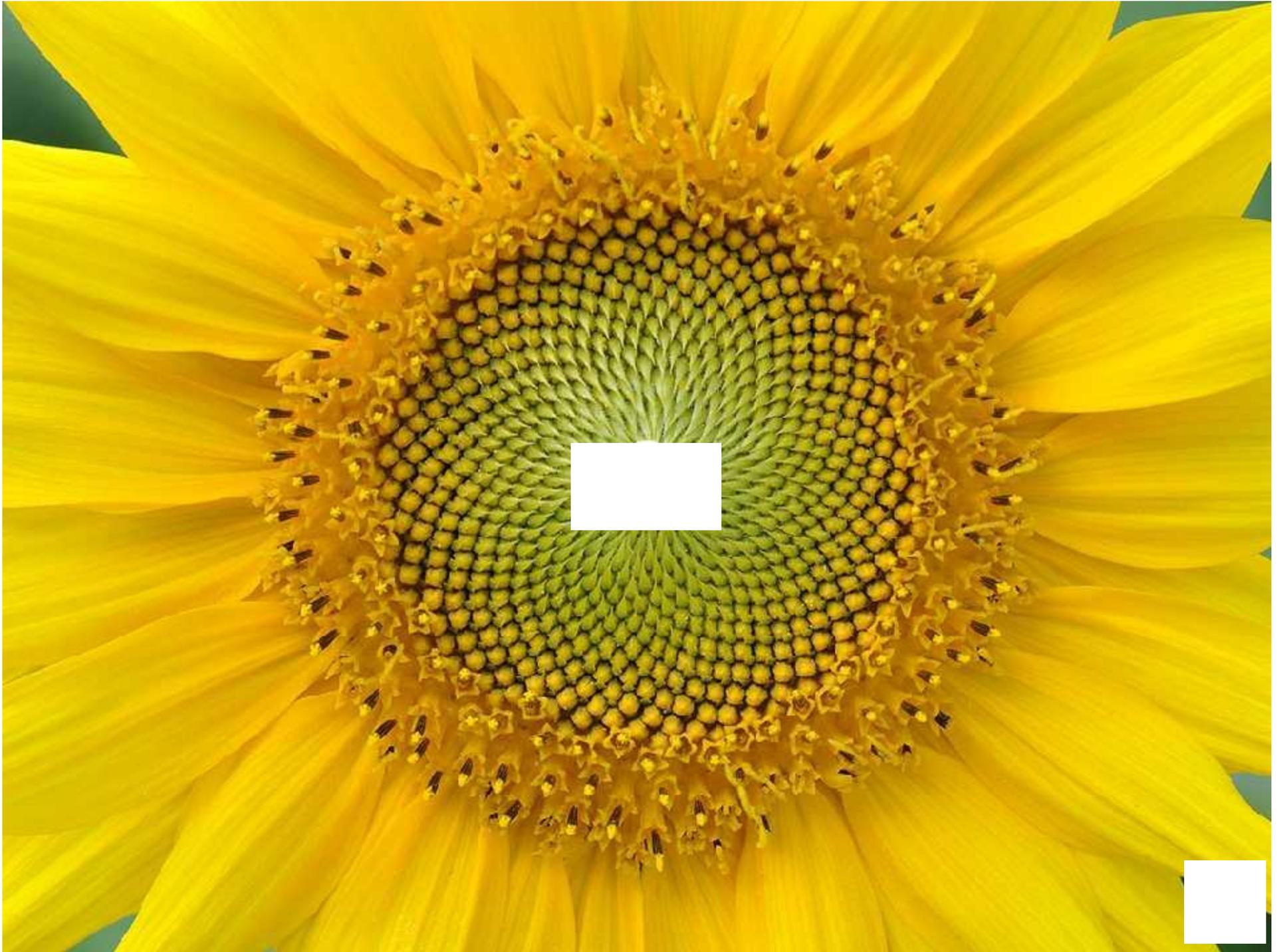
# Plenary

To continue being an amazing learner, it is really important that you are reflective. Being reflective encourages you to think about your learning and identify your strengths as well as the areas you still need to work on so you are able to make progress.

**Write a journal of your learning on rearranging formulae.**

## Questions to think about

- What do we mean by rearranging formulae?
- What is the process of rearranging formulae? Can you remember your steps?
- What areas did you find easy?
- What areas do you still need to work on?
- What is important to remember when rearranging formulae?



# Rearranging Formulae Simple Rearranging

## Instructions

1. Cut out each card.
2. Match up the question to its correct answer.

Make e the subject

$$a = t + e$$

$$v = s - u$$

Make x the subject

$$3x - a = 2x - 5$$

$$c = \frac{d - a}{b}$$

Make v the subject

$$s = v + u$$

$$b = c + \frac{x}{2n}$$

Make c the subject

$$d = a + bc$$

$$e = a - t$$

Make z the subject

$$v = xyz$$

$$t = u + \frac{x}{2a}$$

Make b the subject

$$x = 2n(a - c)$$

$$x = a - 5$$

Make t the subject

$$x = 2a(t - u)$$

$$x = \frac{-r - b}{2}$$

Make x the subject

$$4x + a = 2x - r$$

$$z = \frac{v}{xy}$$

# Rearranging Formulae Fractions and Powers

## Instructions

1. Cut out each card.
2. Match up the question to its correct answer.

Make a the subject

$$x = \frac{abc}{2}$$

$$b = \sqrt{ar}$$

Make b the subject

$$a = \frac{b^2}{r}$$

$$x = y^2$$

Make x the subject

$$a = 2x^2$$

$$x = w(s - 4) - 1$$

Make x the subject

$$y = \sqrt{x}$$

$$a = \frac{2x}{bc}$$

Make b the subject

$$p = b^2$$

$$b = \sqrt{\frac{2x}{a}}$$

Make x the subject

$$w = \frac{x + 1}{s - 4}$$

$$p = \frac{r}{2a}$$

Make b the subject

$$x = \frac{1}{2}ab^2$$

$$b = \sqrt{p}$$

Make p the subject

$$r = \frac{a}{2p}$$

$$x = \sqrt{\frac{a}{2}}$$

# Rearranging Formulae Involving Factorising

## Instructions

1. Cut out each card.
2. Match up the question to its correct answer.

Make  $x$  the subject

$$y(x - 1) = x + 1$$

$$x = \frac{2y}{y - 1}$$

Make  $x$  the subject

$$y = 6 - \frac{x}{x}$$

$$x = \frac{8}{y - 1}$$

Make  $x$  the subject

$$y = \frac{x}{x - 2}$$

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

Make  $x$  the subject

$$bx = x + a$$

$$x = \frac{y + 1}{y - 1}$$

Make  $x$  the subject

$$c = ax + bx$$

$$x = \frac{6y}{y + 1}$$

Make  $x$  the subject

$$bx + a = cx + d$$

$$x = \frac{4 - ab}{b - 1}$$

Make  $x$  the subject

$$\frac{x+8}{x} = y$$

$$x = \frac{d - a}{b - c}$$

Make  $x$  the subject

$$\frac{x+4}{x+a} = b$$

$$x = \frac{a}{b - 1}$$

# Simple Rearranging Answers

Make e the subject

$$a = t + e$$

$$e = a - t$$

Make x the subject

$$3x - a = 2x - 5$$

$$x = a - 5$$

Make v the subject

$$s = v + u$$

$$v = s - u$$

Make c the subject

$$d = a + bc$$

$$c = \frac{d - a}{b}$$

Make z the subject

$$v = xyz$$

$$z = \frac{v}{xy}$$

Make b the subject

$$x = 2n(b - c)$$

$$b = c + \frac{x}{2n}$$

Make t the subject

$$x = 2a(t - u)$$

$$t = u + \frac{x}{2a}$$

Make x the subject

$$4x + b = 2x - r$$

$$x = \frac{-r - b}{2}$$

# Fractions and Powers Answers

Make a the subject

$$x = \frac{abc}{2}$$

$$a = \frac{2x}{bc}$$

Make b the subject

$$a = \frac{b^2}{r}$$

$$b = \sqrt{ar}$$

Make x the subject

$$a = 2x^2$$

$$x = \sqrt{\frac{a}{2}}$$

Make x the subject

$$y = \sqrt{x}$$

$$x = y^2$$

Make b the subject

$$p = b^2$$

$$b = \sqrt{p}$$

Make x the subject

$$w = \frac{x+1}{s-4}$$

$$x = w(s-4) - 1$$

Make b the subject

$$x = \frac{1}{2}ab^2$$

$$b = \sqrt{\frac{2x}{a}}$$

Make p the subject

$$r = \frac{a}{2p}$$

$$p = \frac{r}{2a}$$

# Involving Factorising Answers

Make  $x$  the subject

$$y(x-1) = x+1$$

$$x = \frac{y+1}{y-1}$$

Make  $x$  the subject

$$y = \frac{x}{6-x}$$

$$x = \frac{6y}{y+1}$$

Make  $x$  the subject

$$y = \frac{x}{x-2}$$

$$x = \frac{2y}{y-1}$$

Make  $x$  the subject

$$bx = x+a$$

$$x = \frac{a}{b-1}$$

Make  $x$  the subject

$$c = ax+bx$$

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

Make  $x$  the subject

$$b+a = cx+d$$

$$x = \frac{d-a}{b-c}$$

Make  $x$  the subject

$$\frac{x+8}{x} = y$$

$$x = \frac{8}{y-1}$$

Make  $x$  the subject

$$\frac{x+4}{x+a} = b$$

$$x = \frac{4-ab}{b-1}$$

# Rearranging Formulae (Simple) Answers

1)  $e = a - t$

2)  $v = s - u$

3)  $x = a - 5$

4)  $c = \frac{d - a}{b}$

5)  $b = c + \frac{x}{2n}$

6)  $y = \frac{12 + x}{3}$

7)  $z = \frac{y}{xy}$

8)  $y = x - b$

9)  $t = \frac{x}{2a} + u$

10)  $a = \frac{y - c}{5}$

11)  $x = \frac{-r - b}{2}$

12)  $t = \frac{b + m}{3}$

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# Rearranging Formulae (Simple) Answers

1)  $e = a - t$

2)  $v = s - u$

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4)  $c = \frac{d - a}{b}$

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9)  $t = \frac{x}{2a} + u$

10)  $a = \frac{y - c}{5}$

11)  $x = \frac{-r - b}{2}$

12)  $t = \frac{b + m}{3}$

# Rearranging Formulae (Simple)

1) Make **e** the subject

$$a = t + e$$

---

2) Make **v** the subject

$$s = v + u$$

---

3) Make **x** the subject

$$3x - a = 2x - 5$$

---

4) Make **c** the subject

$$d = a + bc$$

---

5) Make **b** the subject

$$x = 2n(b - c)$$

---

6) Make **y** the subject

$$3y - x = 12$$

---

7) Make **z** the subject

$$v = xyz$$

---

8) Make **y** the subject

$$x = y + b$$

---

9) Make **t** the subject

$$x = 2a(t - u)$$

---

---

10) Make **a** the subject

$$5a = y - c$$

---

11) Make **x** the subject

$$4x + b = 2x - r$$

---

---

12) Make **t** the subject

$$b = 3t - m$$

---

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# Rearranging Formulae (Simple)

1) Make **e** the subject

$$a = t + e$$

Hint: Move the  $t$

---

2) Make **v** the subject

$$s = v + u$$

Hint: Move the  $u$

---

3) Make  $x$  the subject

$$3x - a = 2x - 5$$

Hint 1: Move the  $2x$

Hint 2: Move the  $-a$

---

4) Make **c** the subject

$$d = a + bc$$

Hint 1: Move the  $a$

Hint 2: Move the  $b$

---

5) Make **b** the subject

$$x = 2n(b - c)$$

Hint 1: Move the  $2n$

Hint 2: Move the  $c$

---

6) Make **y** the subject

$$3y - x = 12$$

Hint 1: Move the  $x$

Hint 2: Move the  $3$

---

---

7) Make **z** the subject

$$v = xyz$$

Hint: Move the  $xy$

---

8) Make **y** the subject

$$x = y + b$$

Hint: Move the  $b$

---

9) Make **t** the subject

$$x = 2a(t - u)$$

Hint 1: Move the  $2a$

Hint 2: Move the  $u$

---

10) Make **a** the subject

$$5a = y - c$$

Hint: Move the 5

---

11) Make **x** the subject

$$4x + b = 2x - r$$

Hint 1: Move the  $2x$

Hint 2: Move the  $b$

Hint 3: There's one more step

---

12) Make **t** the subject

$$b = 3t - m$$

Hint 1: Move the  $m$

Hint 2: Move the 3

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# Rearranging Formulae (Simple)

1) Make **e** the subject

$$a = t + e$$

Hint: Move the  $t$

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2) Make **v** the subject

$$s = v + u$$

Hint: Move the  $u$

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3) Make  $x$  the subject

$$3x - a = 2x - 5$$

Hint: Move the  $2x$

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4) Make **c** the subject

$$d = a + bc$$

Hint: Move the  $a$

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5) Make **b** the subject

$$x = 2n(b - c)$$

Hint: Move the  $2n$

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6) Make **y** the subject

$$3y - x = 12$$

Hint: Move the  $x$

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7) Make **z** the subject

$$v = xyz$$

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8) Make **y** the subject

$$x = y + b$$

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9) Make **t** the subject

$$x = 2a(t - u)$$

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10) Make **a** the subject

$$5a = y - c$$

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11) Make **x** the subject

$$4x + b = 2x - r$$

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12) Make **t** the subject

$$b = 3t - m$$

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# Using Factorising Answers

$$1) x = \frac{y+1}{y-1}$$

$$7) x = \frac{d-a}{b-c}$$

$$2) x = \frac{2y}{y-1}$$

$$8) x = \frac{8}{y-1}$$

$$3) x = \frac{1}{2-y}$$

$$9) x = \frac{4-ab}{b-1}$$

$$4) x = \frac{6y}{y+1}$$

$$10) x = \frac{4y}{3}$$

$$5) x = \frac{c}{a+b}$$

$$6) x = \frac{a}{b-1}$$

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# Using Factorising Answers

$$1) x = \frac{y+1}{y-1}$$

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$$4) x = \frac{6y}{y+1}$$

$$10) x = \frac{4y}{3}$$

$$5) x = \frac{c}{a+b}$$

$$6) x = \frac{a}{b-1}$$

# Rearranging Formulae Using Factorising

1) Make  $x$  the subject

$$y(x - 1) = x + 1$$

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2) Make  $x$  the subject

$$y = \frac{x}{x-2}$$

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3) Make  $x$  the subject

$$y = \frac{2x-1}{x}$$

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4) Make  $x$  the subject

$$y = \frac{x}{6-x}$$

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5) Make  $x$  the subject

$$c = ax + bx$$

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6) Make  $x$  the subject

$$bx = x + a$$

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7) Make  $x$  the subject

$$bx + a = cx + d$$

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8) Make  $x$  the subject

$$\frac{x+8}{x} = y$$

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9) Make  $x$  the subject

$$\frac{x+4}{x+a} = b$$

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10) Make  $x$  the subject

$$\frac{x}{x-y} = 4$$

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# Rearranging Formulae Using Factorising

1) Make  $x$  the subject

$$y(x - 1) = x + 1$$

Hint 1: Expand the bracket.

Hint 2: Rearrange the formula so the  $x$ s are one side and  $y$  and 1 are on the other side.

Hint 3: Factorise the side with the  $x$ s on.

Hint 4: Move the bracket part from the factorisation to the other side, forming a fraction with the bracket part becoming the denominator.

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2) Make  $x$  the subject

$$y = \frac{x}{x-2}$$

Hint 1: Move  $x - 2$

Hint 2: Expand any brackets.

Hint 3: Rearrange the formula so the  $x$ s are on the same side.

Hint 4: Factorise the side with the  $x$ s on.

Hint 5: Move the bracket part from the factorisation to the other side, forming a fraction with the bracket part becoming the denominator.

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3) Make  $x$  the subject

$$y = \frac{2x-1}{x}$$

Hint 1: Move  $x$ .

Hint 2: Rearrange the formula so the  $x$ s are on the same side.

Hint 3: Factorise the side with the  $x$ s on.

Hint 4: Move the bracket part from the factorisation to the other side, forming a fraction with the bracket part becoming the denominator.

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4) Make  $x$  the subject

$$y = \frac{x}{6-x}$$

Hint 1: Multiply to get rid of the fraction.

Hint 2: Multiply out any brackets.

Hint 3: Rearrange the formula so the  $x$ s are on the same side.

Hint 4: Factorise the side with the  $x$ s on.

Hint 5: Move the bracket part from the factorisation to the other side, forming a fraction with the bracket part becoming the denominator.

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5) Make  $x$  the subject

$$c = ax + bx$$

Hint 1: Factorise the side with the  $x$ s on.

Hint 2: Move the bracket part from your factorisation to the other side so you form a fraction with the bracket part becoming the denominator.

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6) Make  $x$  the subject

$$bx = x + a$$

Hint 1: Rearrange the formula so the  $x$ s are on the same side.

Hint 2: Factorise the side with the  $x$ s on.

Hint 3: Move the bracket part from the factorisation to the other side, forming a fraction with the bracket part becoming the denominator.

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7) Make  $x$  the subject

$$bx + a = cx + d$$

Hint 1: Rearrange the formula so the  $x$ s are on the same side.

Hint 2: Factorise the side with the  $x$ s on.

Hint 3: Move the bracket part from the factorisation to the other side, forming a fraction with the bracket part becoming the denominator.

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8) Make  $x$  the subject

$$\frac{x+8}{x} = y$$

Hint 1: Multiply to get rid of the fraction.

Hint 2: Rearrange the formula so the  $x$ s are on the same side.

Hint 3: Factorise the side with the  $x$ s on.

Hint 4: Move the bracket part from the factorisation to the other side, forming a fraction with the bracket part becoming the denominator.

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9) Make  $x$  the subject

$$\frac{x+4}{x+a} = b$$

Hint 1: Multiply to get rid of the fraction.

Hint 2: Multiply out any brackets.

Hint 3: Rearrange the formula so the  $x$ s are on the same side.

Hint 4: Factorise the side with the  $x$ s on.

Hint 5: Move the bracket part from the factorisation to the other side, forming a fraction with the bracket part becoming the denominator.

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10) Make  $x$  the subject

$$\frac{x}{x-y} = 4$$

Hint 1: Multiply to get rid of the fraction.

Hint 2: Multiply out any brackets.

Hint 3: Rearrange the formula so the  $x$ s are on the same side.

Hint 4: Factorise the side with the  $x$ s on.

Hint 5: Move the bracket part from the factorisation to the other side, forming a fraction with the bracket part becoming the denominator.

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# Rearranging Formulae Using Factorising

1) Make  $x$  the subject

$$y(x - 1) = x + 1$$

Hint 1: Expand the bracket.

Hint 2: Rearrange.

Hint 3: Factorise.

Hint 4: There is one final step.

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2) Make  $x$  the subject

$$y = \frac{x}{x-2}$$

Hint 1: How do you get rid of the fraction?

Hint 2: Expand any brackets.

Hint 3: Rearrange.

Hint 4: Factorise.

Hint 5: There's one final step.

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3) Make  $x$  the subject

$$y = \frac{2x-1}{x}$$

Hint 1: Move  $x$

Hint 2: Rearrange.

Hint 3: Factorise.

Hint 4: There's one final step.

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4) Make  $x$  the subject

$$y = \frac{x}{6-x}$$

Hint 1: Start by getting rid of the fraction.

Hint 2: Don't forget to expand any brackets.

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5) Make  $x$  the subject

$$c = ax + bx$$

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6) Make  $x$  the subject

$$bx = x + a$$

Hint: You need to rearrange first.

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7) Make  $x$  the subject

$$bx + a = cx + d$$

Hint: You need to rearrange first.

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8) Make  $x$  the subject

$$\frac{x+8}{x} = y$$

Hint: Start by getting rid of the fraction.

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9) Make  $x$  the subject

$$\frac{x+4}{x+a} = b$$

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10) Make  $x$  the subject

$$\frac{x}{x-y} = 4$$

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