

Worksheet 10: Algebra Part 2

Give yourself plenty of space to answer these questions, don't scrunch the answers up in the margin of the handout!

Solving equations

Solve the following equations

1) Solve $3x = 15$

2) Solve $y + 7 = 22$

3) Solve $3a + 7 = 22$

4) Solve $\frac{x}{4} = 20$

Hint: what is the opposite of dividing?

5) Solve $4.5a = 18$

6) Solve $5x - 7 = 3$

7) Solve $4x - 10 = 2$

8) Solve $3k + 10 = 4$

Hint: might be a fraction

9) Solve $\frac{x}{6} + 5 = 8$

10) Solve $2x - 12 = 2$

11) Solve $4(3x - 5) = 28$

12) Solve $6x - 5 = 17$

Hint: might be a mixed number

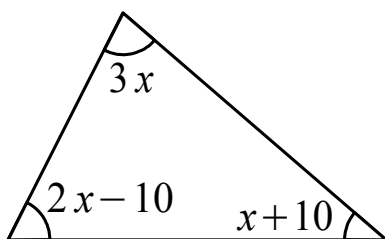
13) Solve $4x + 3 = 6x - 1$

14) Solve $7y - 9 = 5y + 1$

15) Solve $\frac{3}{5}x + \frac{1}{2} = x + 1\frac{1}{2}$

Making expressions (and equations)

- 1) Pens are sold in packs of 12.
Write an expression for the total number of pens in y packs
- 2) Paper clips are sold in boxes of 80.
Write an expression for the total number of paper clips in Q boxes.
- 3) Apples cost 12p each. Satsumas cost 15p each.
Write an expression for the total cost of a apples and s satsumas.
- 4) Cabbages cost 70p each and broccoli costs 60p a bulb.
Write an expression for the cost of c cabbages and b broccoli bulbs.
- 5) Nusut thinks of a number n , doubles it and then adds 3 on.
Write an expression for his answer in terms of n .
- 6) Alice is n years old
Bob is twice as old as Alice
Charlie is 10 years older than Alice
 - a) Form an expression for the total age of the three children
 - b) The total age is 38 years. Work out Alice's age.
- 7) Asif is N years old.
Bharat is three times as old as Asif is.
Cyril is four years younger than Bharat.
 - a) Write an expression for the total age of the three people.
 - b) The total age is 66 years. Work out Cyril's age.
- 8) The triangle below has angles $3x$, $x + 10$ and $2x - 10$
Find the value of the largest angle.



Changing the subject (rearranging the formula)

1) $A = 4b$.

Rearrange the formula to make b the subject.

2) $f = \frac{h}{2}$

Make h the subject of the formula

3) $C = N + 6$

Rearrange the formula to make N the subject

4) $Y = X - 7$

Make X the subject of the formula

5) $C = 5M + 7$

Rearrange the formula to make M the subject

6) $A = \frac{3}{4}b$

Make b the subject of the formula

7) $y = 4x - 5$

Rearrange the formula to express x in terms of y

8) $a = 4x^2$

Make x the subject of the formula

Hint: opposite of squaring is taking the square root

9) $a = \frac{b}{4} - 5$

Rearrange for b

10) $A = ay - y$

Make y the subject of the formula

Hint: factorise y out of the right hand side

11) $y - 3x = 6$

Make y the subject of the formula

Mixed up puzzle problems

These questions are challenging, don't worry about getting 'the answer'. Take a blank sheet of paper and have a bash at each and bring your attempts, doodles and guesses back next week for discussion.

- 1) Find the mean of these three expressions

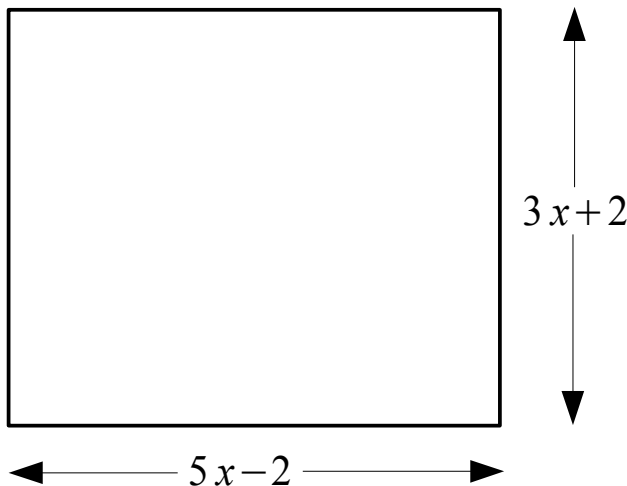
$$x + 10, \quad 3x - 4, \quad 2x + 12$$

Hint: Collect like terms then divide both coefficients by 3

Challenge: is it possible to say which expression is the median?

Challenge 2: can you find a value of x where there is a mode?

- 2) The rectangle below has a perimeter of 48 cm.



Work out the area of the rectangle.

- 3) Below are four expressions

$$3x - 2, \quad 2x^2, \quad 5x, \quad 2x + 4$$

Suppose all you know is that $x > 0$.

Is it possible to put the expressions in order of size?

Hint: try some different values of x like $x = 1$ then $x = 100$

- 4) The sum of two integers is 14 and the product is -72 .
Find the values of the integers.
- 5) If $AB = 0$ and $A \neq B$, what can you say about A or B ?