

For each problem, include a complete solution. Remember to include let and therefore statements.

1. Suppose that two sides of a triangle are equal, and the third side is 10cm greater than each of the other two. The perimeter of the triangle is 100cm. Find the length of each side.

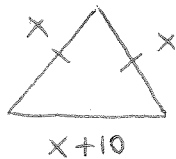
let x represent the smaller side

$$x + x + (x + 10) = 100$$

$$3x + 10 = 100$$

$$\frac{3x}{3} = \frac{90}{3}$$

$$x = 30$$



2. The perimeter of a rectangle is 156cm. The length is twice as long as the width. Find the length and the width.

let x represent the width
let $2x$ represent the length

$$2(2x) + 2x = 156$$

$$4x + 2x = 156$$

$$6x = 156$$

$$x = 26$$

∴ the length is 52cm and the width is 26cm.

3. Find four consecutive odd numbers whose sum is 240.

let the numbers be

$$x, x+2, x+4, x+6$$

$$x + (x+2) + (x+4) + (x+6) = 240$$

$$4x + 12 = 240$$

$$\frac{4x}{4} = \frac{228}{4} \quad x = 57$$

∴ The numbers are 57, 59, 61, 63

4. Wanda has seven more dimes than nickels. The total value of coins is \$6.55. How many nickels does she have?

	# of coins	value in cents
nickels	x	$0.05(x)$
dimes	$x+7$	$0.10(x+7)$
total		6.55

$$0.05(x) + 0.10(x+7) = 6.55$$

$$0.05x + 0.10x + 0.7 = 6.55$$

$$0.15x = 5.85$$

$$x = 39$$

5. A collection of 33 coins, consisting of nickels, dimes, and quarters, has a value of \$3.30. If there are three times as many nickels as quarters, and one-half as many dimes as nickels, how many coins of each kind are there?

	# of coins	value in cents
nickels	$3x$	$0.05(3x)$
dimes	$\frac{3x}{2}$	$0.10\left(\frac{3x}{2}\right)$
quarters	x	$0.25(x)$
total	33	3.30

$$0.05(3x) + 0.10\left(\frac{3x}{2}\right) + 0.25(x) = 3.30$$

$$\text{nickels} \rightarrow 3(6) = 18 \quad 0.15x + 0.15x + 0.25x = 3.30$$

$$\text{dimes} \rightarrow \frac{3(6)}{2} = 9$$

$$\text{quarters} \rightarrow 6$$

$$0.55x = 3.30$$

$$x = \frac{3.30}{0.55}$$

$$x = 6$$

6. Allison is 29 years older than Nicole. Fifteen years from now, Allison will be twice as old as Nicole. How old are they today?

	now	15 years from now
Allison	$x+29$	$(x+29) + 15 = x+44$
Nicole	x	$x+15$

let x rep. Nicole's age in years

Allison's age = 2 times Nicole's age

$$x + 44 = 2(x + 15)$$

$$x + 44 = 2x + 30$$

$$44 - 30 = 2x - x$$

$$14 = x$$

Allison's age is $= 14 + 29 = 43$ years old.