

Primary Division 2017-2018 Round 1 Solutions

- P1.1.** A prize of £150 is split between 3 winners A, B and C.
A gets £50 less than B and B gets twice as much as C.

How much does each of them receive?

Solution 1

If we add £50 to what A actually got, then the total prize money would be £200.

So A and B would then both get twice as much as C.

So C would get one fifth of £200 which is £40.

So B would get £80 and A would get £30.

Solution 2

Let C get x pounds then B gets £ $2x$ and A gets £ $(2x - 50)$

$$(2x - 50) + 2x + x = 150$$

$$5x = 200$$

$$x = 40$$

So A gets £30, B gets £80 and C gets £40.

- P1.2.** In our local town we still have a grocer, newsagent, butcher and baker and they have shops next to each other. They are all members of the local golf club and their names are Alan, Bill, Colin and David (not, perhaps, in this order).

Colin and David shave themselves whereas the baker prefers to go to the barber's across the way. David and Alan often play golf with the newsagent and the baker. David's shop is next to the butcher's.

One of the men has a beard. What is his occupation?

Solution - one of many variations

'Colin and David shave themselves whereas the baker prefers to go to the barber's across the way.'
Neither Colin nor David is the baker.

'David and Alan often play golf with the newsagent and the baker.' David and Alan are not the newsagent or baker.

Bill must be the baker and Colin must be the newsagent.

'David's shop is next to the butcher's.' David cannot be the butcher so he must be the grocer leaving Alan as the butcher.

The man with the beard is the butcher.

P1.3. Jonas travels 26 miles in 3 hours, partly on foot and partly by bike. He walks at 4 mph and cycles at 12mph. For what length of time does Jonas walk? How far does he cycle?

Solution 1

If Jonas walked for 3 hours, he would cover 12 miles.

So, he need to make up 14 miles by cycling. His extra speed is 8mph and at that speed he would need to travel $1\frac{3}{4}$ hours to cover 14 miles.

So he must walk for $1\frac{1}{4}$ hours and cycle for $1\frac{3}{4}$ hours.

Check: $1\frac{1}{4} \times 4 = 5$; $1\frac{3}{4} \times 12 = 21$ and $5 + 21 = 26$ as required.

Solution 2

Let Jonas walk x miles and so he cycles $(26 - x)$ miles.

$$\frac{x}{4} + \frac{26 - x}{12} = 3$$

$$3x + 26 - x = 36$$

$$2x = 10$$

$$x = 5$$

So Jonas walks 5 miles in 1 hour 15 minutes and cycles 21 miles in 1 hour 45 minutes.

Solution 3

Let Jonas walk t hours and so he cycles $(3 - t)$ hours.

$$4t + 12(3 - t) = 26$$

$$4t + 36 - 12t = 26$$

$$36 - 26 = 8t$$

$$8t = 10 \Rightarrow t = 1\frac{1}{4}$$

So Jonas walks for 1 hour 15 minutes and covers 5 miles and cycles for 1 hour 45 minutes and covers 21 miles.