



Problem of the Week

Problem B and Solution

Right On, Dude!

Problem

- a) On centimetre graph paper, construct a right angle with sides $\mathbf{a} = 3$ cm and $\mathbf{b} = 4$ cm which meet at the right angle. Measure the length of the third side \mathbf{c} . Enter your answer in the table below.
- b) Next, construct a right angled triangle with sides $\mathbf{a} = 6$ cm and $\mathbf{b} = 8$ cm which meet at the right angle. How long do you think the third side \mathbf{c} will be? Measure it to find out, and enter its length in the table.
- c) Look at the patterns for sides \mathbf{a} , \mathbf{b} , and \mathbf{c} in your table to try to predict the side lengths \mathbf{b} and \mathbf{c} for the next triangle. Draw this triangle to confirm your predictions, and enter the lengths in the table.
- d) Repeat part c) for the last row to complete the table.
- e) Write a pattern rule for the length of each side in the table.

Solution

Triangle	Side a (cm)	Side b (cm)	Side c (cm)
Part a)	3	4	5
Part b)	6	8	10
Part c)	9	12	15
Part d)	12	16	20

- a) The third side is 5 cm long.
- b) Since sides \mathbf{a} and \mathbf{b} are $2 \times$ those of part a), we expect $\mathbf{c} = 2 \times 5 = 10$ cm, which is what it measures to be.
- c), d) Predicted sides are, respectively, $3 \times$ and $4 \times$ those in part a). The completed table above shows the resulting lengths.
- e) The pattern rules for the side lengths are:
 - Side \mathbf{a} : multiples of 3, i.e., 3, 6, 9, 12, ... ;
 - Side \mathbf{b} : multiples of 4, i.e., 4, 8, 12, 16, ... ;
 - Side \mathbf{c} : multiples of 5, i.e., 5, 10, 15, 20,

Alternatively, the rules could be written as:

- "Starting with 3 add 3 to the previous side length" for Side \mathbf{a} ;
- "Starting with 4 add 4 to the previous side length" for Side \mathbf{b} ;
- "Starting with 5 add 5 to the previous side length" for Side \mathbf{c} .

