

Section B

B1

What is $4 \times 17 - 4 \times 16$?

Solution. If we take 17 copies of 4 and add them together, then take away 16 copies of 4, we are then left with a single copy of 4.

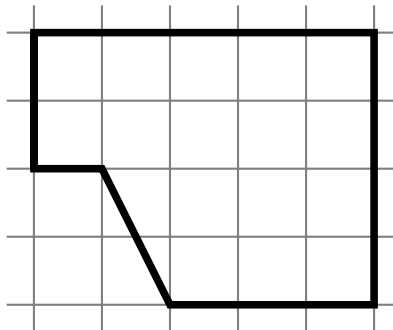
In other words,

$$4 \times 17 - 4 \times 16 = 4 \times (17 - 16) = 4 \times 1 = 4$$

Answer to B1: 4

B2

If each grid cell has area 1, what is the area of the following figure?



Solution. Adding up the completely filled in squares, we see there are 16. Then there is a square that is one quarter filled in, and another square that is three quarters filled in. Putting these squares together, we get another whole square, for a total area of 17.

Answer to B2: 17

B3

Neda has 25 gold coins and Rubin has 13. How many coins should Neda give Rubin for them to have the same number?

Solution. The total number of coins is $25 + 13 = 38$. If Neda and Rubin have the same number of coins, they must both have $38/2 = 19$ coins. So, Neda should give 6 coins to Rubin.

Answer to B3: 6

B4

What is the smallest positive whole number such that, when you multiply its digits together, you get 18?

Solution. We notice that $18 = 2 \times 9$, so 29 works. Try to convince yourself that this is the smallest possible number that works.

Answer to B4: 29

B5

If 5 people can build 5 bikes in 5 days, how many bikes can 10 people build in 10 days?

Solution. Since 5 people can build 5 bikes in 5 days, we know that 5 people can build 10 bikes in 10 days. So, 10 people can build 20 bikes in 10 days.

Answer to B5: 20

B6

The sum of three consecutive whole numbers is 123. What is the largest of those three numbers? (Consecutive whole numbers are whole numbers that are right next to each other, like 3, 4, and 5.)

Solution. Since the three numbers are consecutive, the sum of three consecutive numbers that sums to 123 can be obtained by dividing 123 by three to determine one of the three numbers. 123 divided by three equals 41. By subtracting and adding one, the other two numbers are 40 and 42.

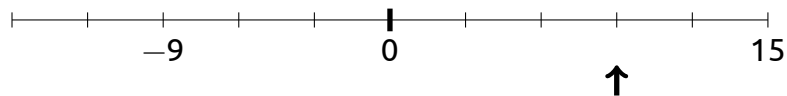
Check: $40 + 41 + 42 = 123$

Thus, the largest of these three numbers is 42.

Answer to B6: 42

B7

A few whole numbers are labelled in the number line below, but the other labels are missing. The ticks are spaced equally apart. Be careful, as not every whole number is marked with a tick. What number is pointed to by the arrow?

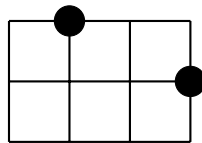


Solution. Observe that there are 5 spaces between 0 and 15. This means that the ticks are spaced at a distance of $15/5 = 3$ apart. So, the arrow points to 9.

Answer to B7: 9

B8

If each move may only be a single point up or right and the indicated points may not be crossed, how many routes are there from the bottom left corner to the top right?



Solution. Just count all the possible paths – there are 3.

Answer to B8: 3