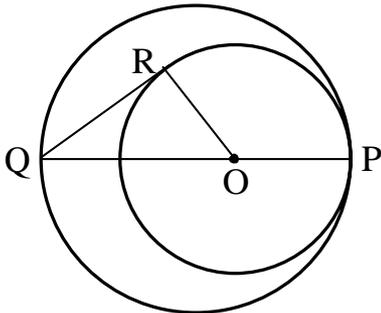


1. Every whole number larger than the number 1 has at least 2 factors:  
the number itself and the number 1.  
Find the sum of all the factors of 33. \_\_\_\_\_ 1

2. In the diagram, a circle of radius 6 is internally tangent at P to  
a circle of radius 8. PQ is a diameter of the larger circle,  
QR is tangent to the smaller circle,  
and OR is a radius of the smaller circle.  
Find the area of the triangle OQR. \_\_\_\_\_ 2



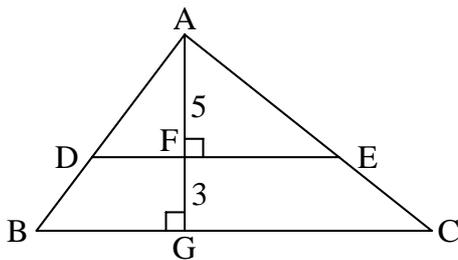
3. A bicycle wheel covers a distance of 45 metres  
when it makes 25 revolutions. How many revolutions  
are needed to cover a distance of 99 metres? \_\_\_\_\_(revolutions) 3

4. In a certain sequence,  $a_1 < 0$ ,  $a_2 > 0$ , and  $a_3 > 0$ .  
For  $n > 2$ ,  $a_n = a_{n-1} + a_{n-2}$ .  
Two consecutive terms of the sequence have values of 29 and 47.  
Find the value of  $a_1 + a_2 + a_3$ . \_\_\_\_\_ 4

Grade Seven (7) Division

5. Nick received a sum of money as a present for his 13-th birthday.  
 $\frac{2}{5}$  of that sum was spent on computer games,  
 $\frac{1}{2}$  of the remainder was spent on healthy snacks,  
 and the rest was saved. Nick spent 11 dollars more  
 on computer games than he spent on snacks.  
 How much money (in dollars) did he save? \_\_\_\_\_(\$)

6. In the diagram, BCED is a trapezoid. The length of DE is 10.  
 The line segment AG is a height of the large triangle,  
 and it intersects DE at F. Also given: AF=5, and FG=3.  
 Find the area of the trapezoid. \_\_\_\_\_ 6

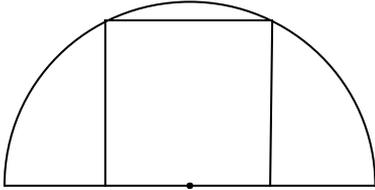


7. Bus fare in Vancouver on the route from Spanish Banks  
 to UBC is \$2.25 per adult and \$1.50 per junior. Last Saturday,  
 610 people rode the bus, and paid a total of \$1218.  
 How many adults rode the bus that day? \_\_\_\_\_(adults)

8.  $\frac{1}{6}$  of Diophantus' life was spent as a youth, and then  
 it took  $\frac{1}{12}$  of his life to lengthen his beard. After another  $\frac{1}{7}$   
 of his life he got married, and then, 5 years later, a child was born.  
 The child left our world to live with the angels when he turned  
 2 years old and this happened 2 years before Diophantus  
 reached  $\frac{1}{2}$  of his life. How old was Diophantus when he died? \_\_\_\_\_(years)

Grade Seven (7) Division

9. The radius of a semicircle is 10 metres. A square is inscribed in the semicircle, with one side on the diameter, as shown in the diagram. Find the area of the square (in  $m^2$ ).



\_\_\_\_\_ ( $m^2$ ) 9

10. The human body has (on average) 114 trillion cells ( $114 \times 10^{12}$ ). The weight of each cell (on average) is  $55 \times 10^{-11}$  grams. What is the average weight of the human body (in kilograms)? Give your answer as a decimal, correct to one decimal place.

\_\_\_\_\_ (kg) 10

11. What is the remainder when  $10^{24}$  is divided by 9997?

\_\_\_\_\_ 11

12. Aziz wrote all of the ten thousand integers from the number 1 to the number 10000, one by one, in increasing order. The beginning of his sequence looks like this:  
1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, ...  
Note that he wrote the digit 0 for the first time when he wrote the number "10", and he wrote it for the second time when he wrote the number "20".  
In what number N, of his sequence, did he write the digit 0 for the 2007-th time?

\_\_\_\_\_ 12