DAYSPRING INTERNATIONAL ACADEMY

Mathletics for Lower Secondary

Read the questions *carefully*. Answer the questions in the spaces provided on the question sheets. If you run out of room for an answer, continue on the back of the page.

Student's Name: _____

Instructor's Name: Nana Baah Akuffu

Time Allowed: 10 minutes

1. 144 is a square number. True/False

   Solution:
   True

2. Estimate the value of $\sqrt{88}$

   Solution:
   $\sqrt{88}$ is between 9^2 and 10^2. Hence any value between 9 and 10 is good

3. Find the value of $\sqrt{1^2 + 2^2 + 3^2 + 4^2}$.

   Solution:
   $1^2 + 2^2 + 3^2 + 4^2 = 1 + 4 + 9 + 16 = 30$. Hence the answer is $\sqrt{30}$.

4. What are the factors of 108?

   Solution:
   Factors of $108 = \{1, 2, 3, 4, 6, 9, 12, 18, 27, 36, 54, 108\}$

5. What are the prime factors of 99?

Solution:
$99 = 3 \times 3 \times 9$

6. Is 6786 divisible by 9?

Solution:
Yes

7. What are the square numbers that add up to 125?

Solution:
They are either;

1. $9 + 100 + 16$ or
2. $25 + 64 + 36$

8. What is the 20^{th} square number?

Solution:
400 because $20 \times 20 = 400$

9. Calculate

$$\frac{2.2 + 7.8}{1.5 - 0.5}$$

Solution:

$$\frac{2.2 + 7.8}{1.5 - 0.5} = \frac{10}{1} = 10 \tag{1}$$

10. What fraction is equivalent to 0.035?

Solution:
$\frac{35}{1000}$

11. There were 56 students in Mr. K's class, 29 students in Mr. P's class, and 43 students in Mr. S's class. Approximately how many students were there in all three classes?

Solution:
There were 128

12. What is the Highest Common Factor of 36 and 54?

Solution:

$$36 = 2 \times 2 \times 3 \times 3 \tag{2}$$
$$54 = 2 \times 3 \times 3 \times 3 \tag{3}$$
$$\text{HCF} = 2 \times 3 \times 3 = 18 \tag{4}$$

13. If $5^n = 0.2$, what is the value of n?

Solution:

$$5^n = 0.2 \tag{5}$$
$$5^n = \frac{1}{5} \tag{6}$$
$$5^n = 5^{-1} \tag{7}$$
$$n = -1 \quad \text{Since the bases are the same.} \tag{8}$$

14. What integer is closest to $\sqrt{250}$?

Solution:
16

15. What are the values of each of the following?

    1. $-3+4+5$
    2. $-20+19-19$
    3. $6-7-3+3$
    4. $-6+1+5$
    5. $-3--2+-3$

Solution:

1. 6
2. -20
3. -1
4. 0
5. -4

16. One Saturday, an electronics store gave away free mini-ipods to any customer who purchased merchandise totalling over \$1,000. If there were a total of 26 purchases totalling over \$1,000 each that Saturday, what is the integer that represents the change in number of free mini-ipods the store had in stock at the end of the day Saturday?

Solution:
-26

17. *Challenge Problem.* Anna was planning how to seat guests at a dinner. There were between 50 and 100 people coming. Anna noticed that they could be seated with 8 people to a table and no seats left empty. She also noticed that they could be seated with 12 people to a table with no seats left empty. What is the highest possible number of guests coming?

Solution:
This is a problem of LCM. Hence the prime factors of the numbers are

$$8 = 2 \times 2 \times 2 \tag{9}$$
$$12 = 2 \times 2 \times 3 \tag{10}$$
$$\text{LCM} = 2 \times 2 \times 2 \times 3 = 24 \tag{11}$$

Now if the number of guests is between 50 and 100, then their number will be a multiple of 24. $24 \times 4 = 96$ which is between 50 and 100.