Mathematics 1 – Grade 8

Welcome to your Conquesta Olympiad. When you have decided which of the answers is correct, scratch out the letter in the matching square on your answer sheet. Example:- If the answer to question 4 is c, then scratch out the letter c in the square containing c next to the number 4 *(see example 1 below)*. If you've made a mistake and b should have been the answer, neatly cross out the mistake and then scratch out b *(see example 2 below)*.

Example 1:- | 4. | a | b | ● | d |

Example 2:- | 4. | a | 🖅 | ☒ | d |

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*Useful tip:– When you have number sentences using different operations, apply the rule of **BODMAS**, which is the order of operations:– Firstly, calculate whatever is in **B**rackets, then **O**ther (of, square roots, power of, etc), then **D**ivision and **M**ultiplication (from left to right as they rank equally), and lastly, **A**ddition and **S**ubtraction (also from left to right).*

Squared numbers *are numbers multiplied by themselves, e.g., 4 x 4 = 16. This can also be written as '4 to the power of 2', '4 to the second power' or simply '4 squared', e.g., $4^2 = 16$. So, 4 squared is 16; and the square root of 16 = 4. The little 2 is called an exponent. The **square root** symbol is $\sqrt{}$.*

When we square a negative number, we get a positive result, e.g., $(-5)^2$ is worked out like this: (-5) x (-5) = 25. This is the same result as 5^2: 5 x 5 = 25.

The Laws of Exponents
*The **exponent** of a number says how many times to use the number in a multiplication. If the exponent is 1, then the number remains the same, e.g., $9^1 = 9$. If the exponent is 0, then you get 1, e.g., $9^0 = 1$. (Exponents are also called **powers** or **indices**.)*

*A **negative exponent** means how many times to divide **one** by a number, e.g., $8^{-1} = 1 \div 8 = 0,125$. You can have many divides: e.g., $5^{-3} = 1 \div 5 \div 5 \div 5 = 0,008$.*

It is easier to start with '1' and then multiply or divide as many times as the exponent says, then you will get the right answer, for example:

Example : Powers of 5			
	.. etc..		
5^2	1 x 5 x 5	25	↑
5^1	1 x 5	5	5x Larger
5^0	1	1	-----
5^{-1}	1 ÷ 5	0,2 or $^1/_5$	5x Smaller
5^{-2}	1 ÷ 5 ÷ 5	0,04	↓
	.. etc..		

*A **fractional exponent** like 1/n (or, e.g., 1/3) means to take the nth (or 3rd) root, e.g., $x^{1/n} = \sqrt[n]{x}$ (or $x^{1/3} = \sqrt[3]{x}$).*

1. Two friends share 72 sweets between them in the ratio of 1:3. If Sally took the most, how many sweets did she get?

(a) 24 (b) 54
(c) 18 (d) 36

2. A sports shop pays R504 for a hockey stick. Their mark-up is 105%. What is the selling price of the hockey stick?

(a) R529,20 (b) R609,00
(c) R1 033,20 (d) R509,00

3. What is the highest common factor of 63 and 54?

(a) 9 (b) 6
(c) 21 (d) 18

4. Natalie picks 3 360 apples in 8 hours. Therefore, her rate per minute is ......

(a) 56 apples. (b) 420 apples.
(c) 37 apples. (d) 7 apples.

5. A farmer reaped 6 000 bags of maize last year. If his crop is 20% worse this year, how many bags will he reap?

(a) 5 880 (b) 5 980
(c) 4 800 (d) 1 200

6. A father agreed to share out his land to his sons in the following proportions: $^3/_8$ to Thabiso, $^2/_5$ to Andile and the rest to Linda.
What is the ratio that his land is shared out?

(a) 3:2:1 (b) 6:4:10
(c) 15:16:9 (d) 9:6:12

7. Janice has a bank balance of -R150. What will the balance be after a deposit of R2 500 and a withdrawal of R560?

(a) R2 090 (b) -R1 790
(c) R1 790 (d) -R2 090

8. Calculate:- *(BODMAS Rule)*

$$(-36) + (-12) \div (-3)$$

(a) -40 (b) -32 (c) 16 (d) -16

9. Calculate:-

$$\sqrt{36} + \left(\sqrt[3]{64} \times (-2) \right)$$

(a) 14 (b) 2 (c) -20 (d) -2

10. The Great Wall of China is $8,85 \times 10^6$ m long. This means that its length is ......

(a) 88 500 km (b) 8 850 km
(c) 885 km (d) 8 850 000 km