ASTEMI
SCIENCE TECHNOLOGY ENGINEERING MATHEMATICS INNOVATION
OLYMPIADS & COMPETITIONS

Conquesta 2019

(International Multiple Choice Primary School Olympiads – Est. 1998)
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Mathematics 2 – 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

*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., $8^{-1} = \mathbf{1} \div 8 = 0{,}125$. You can have many divides: e.g., $5^{-3} = \mathbf{1} \div 5 \div 5 \div 5 = 0{,}008$.*

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..		↑ 5x Larger
5^2	1 x 5 x 5	25	
5^1	1 x 5	5	
5^0	1	1	
5^{-1}	1 ÷ 5	0,2 or $^1/_5$	
5^{-2}	1 ÷ 5 ÷ 5	0,04	5x Smaller ↓
	.. 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 sisters share a bag of sweets. There are 60 sweets. Sally took 36 and Sandy took the rest. What ratio did they use to share the sweets?**

(a) 5:3 (b) 2:1
(c) 3:2 (d) 12:5

2. **A sports shop charges R504 for a hockey stick that cost R360. What mark-up percentage is the shop is using?**

(a) 50,4% (b) 36%
(c) 71,4% (d) 40%

3. **63 as a ***product*** of its prime factors, is ……**

(a) 6 x 3 (b) 9 x 7
(c) 21 x 3 (d) 3^2 x 7

4. **Natalie picks 4 apples per minute. How many apples will she pick in 2 hours?**

(a) 360 apples.
(b) 60 apples.
(c) 240 apples.
(d) 480 apples.

5. **Mrs. de Wit earns R12 500 per month. She needs R4 500 for rent and R2 000 for food. What portion of her money is left over for spending on other things?**

(a) 52% (b) 48% (c) 50% (d) 62%

6. **Janice has a bank balance of R1 500. What will her balance be after a deposit of R2 500 and a withdrawal of R560?**

(a) -R440 (b) -R1 560 (c) R3 440 (d) R4 560

7. **What is the difference between these?**

$4-(-12)$ and $5-2(-3)$

(a) 5 (b) 10 (c) -19 (d) 14

8. **Calculate:-**

$$\sqrt{36+64}$$

(a) 14 (b) 10 (c) $\sqrt{14}$ (d) 50

9. **A skirt costs R500. If 15% VAT must be added to this price, how much will the skirt sell for?**

(a) R507,50 (b) R425 (c) R575 (d) R75

10. **Simplify:-**

$$(2 \times p + 24) \div 6$$

(a) $\frac{13p}{3}$ (b) $\frac{p}{3}+4$ (c) $\frac{p+4}{3}$ (d) $\frac{1}{3p}+4$