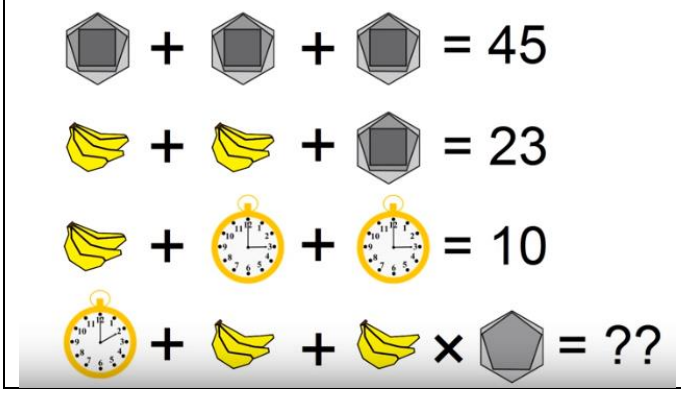
AIMSSEC

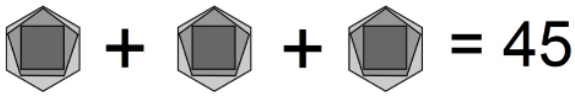
AFRICAN INSTITUTE FOR MATHEMATICAL SCIENCES
SCHOOLS ENRICHMENT CENTRE
TEACHER NETWORK

Bananas, Clock, and Hexagon

Can you figure this out?



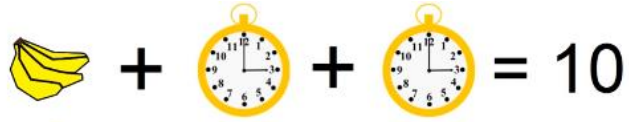
SOLUTION



Each of the hexagon in the first and the second equation has 15 edges.

= 15, which implies 1 edge = 1.

4 Bananas + 4 Bananas + 15 edges = 23, which implies 1 Banana = 1.



4 Bananas + 3 o'clock + 3 o'clock = 10, which implies each hour = 1.

This equation implies: 2 o'clock + 3 Bananas + 3 Bananas * 11 edges =??

2 + 3 + 3 * 11 = 2 + 3 + (3 * 11) =??

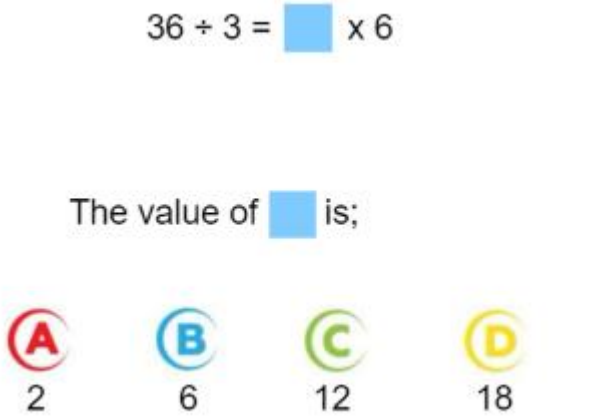
5 + 33 = **38**.

NOTES FOR TEACHERS

Diagnostic Assessment This should take about 5–10 minutes.

1. Write the question on the board, say to the class:
   "Put up 1 finger if you think the answer is A, 2 fingers for B, 3 fingers for C and 4 fingers for D".
2. Notice how the learners responded. Ask a learner who gave answer A to explain why he or she gave that answer and DO NOT say whether it is right or wrong but simply thank the learner for giving the answer.
3. Then do the same for answers B, C and D. Try to make sure that learners listen to these reasons and try to decide if their own answer was right or wrong.

4. **Ask the class again to vote for the right answer by putting up 1, 2, 3 or 4 fingers. Notice if there is a change and who gave right and wrong answers.** It is important for learners to explain the reason for their answer otherwise many learners will just make a guess.
5. If the concept is needed for the lesson to follow, explain the right answer or give a remedial task.



A is the correct answer.

Common Misconceptions Learners who answer B, C or D are either just guessing or couldn't figure out what the symbols represent or have a poor understanding of multiplication and division.

https://diagnosticquestions.com

Why do this activity?

This activity gives a good bridge between number work and algebra and learners can work on it without any algebraic notation. This is a pre-algebra task that challenges learners to reason about several unknowns, to look for ways to record the information given and to use the information given to find the unknowns. It introduces learners to the sort of manipulations that can be used to solve simultaneous equations. Later the activity can be used to progress from words to formulas.

Learning objectives:

For learners to: 1. develop logical reasoning and written and oral communication skills; 2. find their own methods for solving simultaneous equations without using any algebraic notation or formal procedures.

Generic competences

Tell the learners that: "This is a really interesting problem because it can be solved in lots of different ways, make your choice about where to start." "Can you find the missing total that should go where the question mark has been put?" Finish the lesson by inviting learners to the board to share their answers and explain their methods.
Suggestions for teaching

Key questions

Here are some prompts that could be offered to learners working on the different approaches if they get stuck:

- Compare the symbols in the four equations, which of the symbol is the same and which is different?
- What can you deduce by comparing the hexagon in the first and the second equations with the hexagon in the last equation?
- What can you deduce by comparing the bananas in the second and the thrid equations with the bananas in the last equation?
- Could you work out the value of the hexagon in the first equation?
- How could you then work out the value of the bananas in the second equation?

- If you could work out the values of the bananas in the second equation, how could you then work out the value of the clock in the third equation?
- What are the values of the bananas, hexagon and clock in the last equation?

Possible extension

Ask learners to create their own puzzle and give another learner to solve. Suggest they use Bananas, Clock and Hexagon with different values and write in their own totals leaving some totals for another learner to discover.

Click the link for a related lesson activity: **https://aiminghigh.aimssec.ac.za/grades-7-and-8-whats-it-worth/**

Possible support

Learners could work in pairs to solve the problem. The problem could also be solved by trial and improvement, by inviting learners to choose a value for a shape and explore the consequences.

Note: The Grades or School Years specified on the AIMING HIGH Website correspond to Grades 4 to 12 in South Africa and the USA, to Years 4 to 12 in the UK and up to Secondary 5 in East Africa. New material will be added for Secondary 6.
For resources for teaching A level mathematics see https://nrich.maths.org/12339
Note: The mathematics taught in Year 13 (UK) and Secondary 6 (East Africa) is **beyond** the school curriculum for Grade 12 SA.

	Lower Primary or Foundation Phase Age 5 to 9	**Upper Primary Age 9 to 11**	**Lower Secondary Age 11 to 14**	**Upper Secondary Age 15+**
South Africa	**Grades R and 1 to 3**	**Grades 4 to 6**	**Grades 7 to 9**	**Grades 10 to 12**
USA	**Kindergarten and G1 to 3**	**Grades 4 to 6**	**Grades 7 to 9**	**Grades 10 to 12**
UK	**Reception and Years 1 to 3**	**Years 4 to 6**	**Years 7 to 9**	**Years 10 to 13**
East Africa	**Nursery and Primary 1 to 3**	**Primary 4 to 6**	**Secondary 1 to 3**	**Secondary 4 to 6**