Algebra and formulas

we learnd pythagoras' theorem in unit 4. we can express the theorem as $a^2+b^2=c^2$ this is an equation. it has tow sides with an equals sign between.

in the equation above there are three variables. we use letters to represent the variables as a, b and c. when we use letters like a, b, c to represent variables, we are using algebra.

if we know the value of a and b, we can work out the value of c. in other words, we can solve the equation. we can find the value of the unknown, in this case (c)

for example:

if $a=3$ and $b=4$

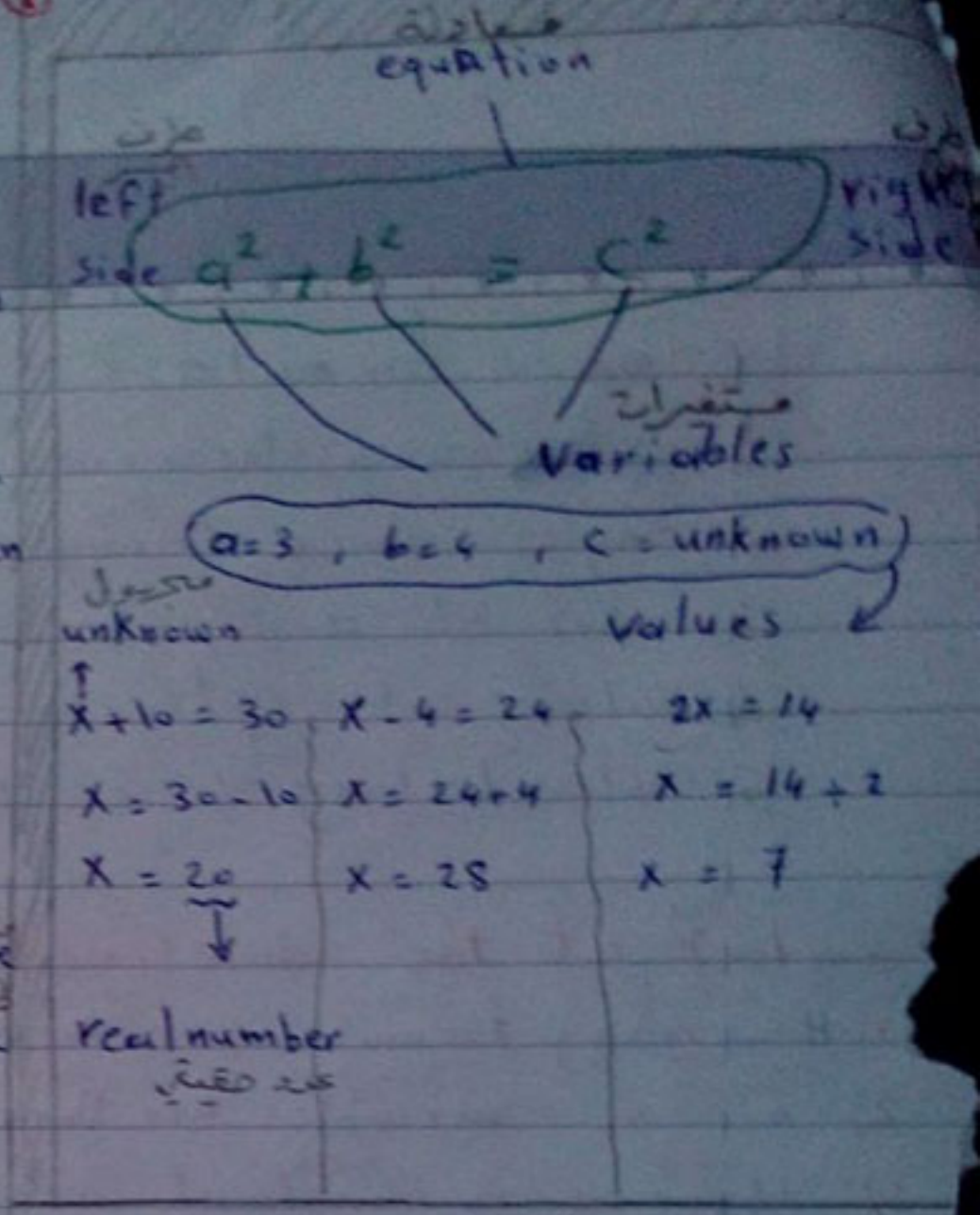
then $a^2=9$, $b^2=16$

which means that $a^2+b^2=25$

so c^2 must be 25

and $c=\sqrt{25}$

therefore $c=5$.



common formulas?

1 pythagoras' theorem: $a^2 + b^2 = c^2$

2 Angles in a triangle: a+b+c = 180°

3 Radius of a circle: $r = \frac{d}{2}$

4 Volume of sphere: $V = \frac{4}{3}\pi r^3$

5 Calculating %: $p = \frac{a}{b} \cdot 100$

** look at the whiteboard below. answer the questions?

1) How many formulas are there? Five - 5

2) " " variables are there in the formulas? 13 variables

3) there is a constant in formula 4. what is it? pi = π

4) How many real numbers are there in the formulas? 5 - five

5) what is on the left side of formula 1? $a^2 + b^2$

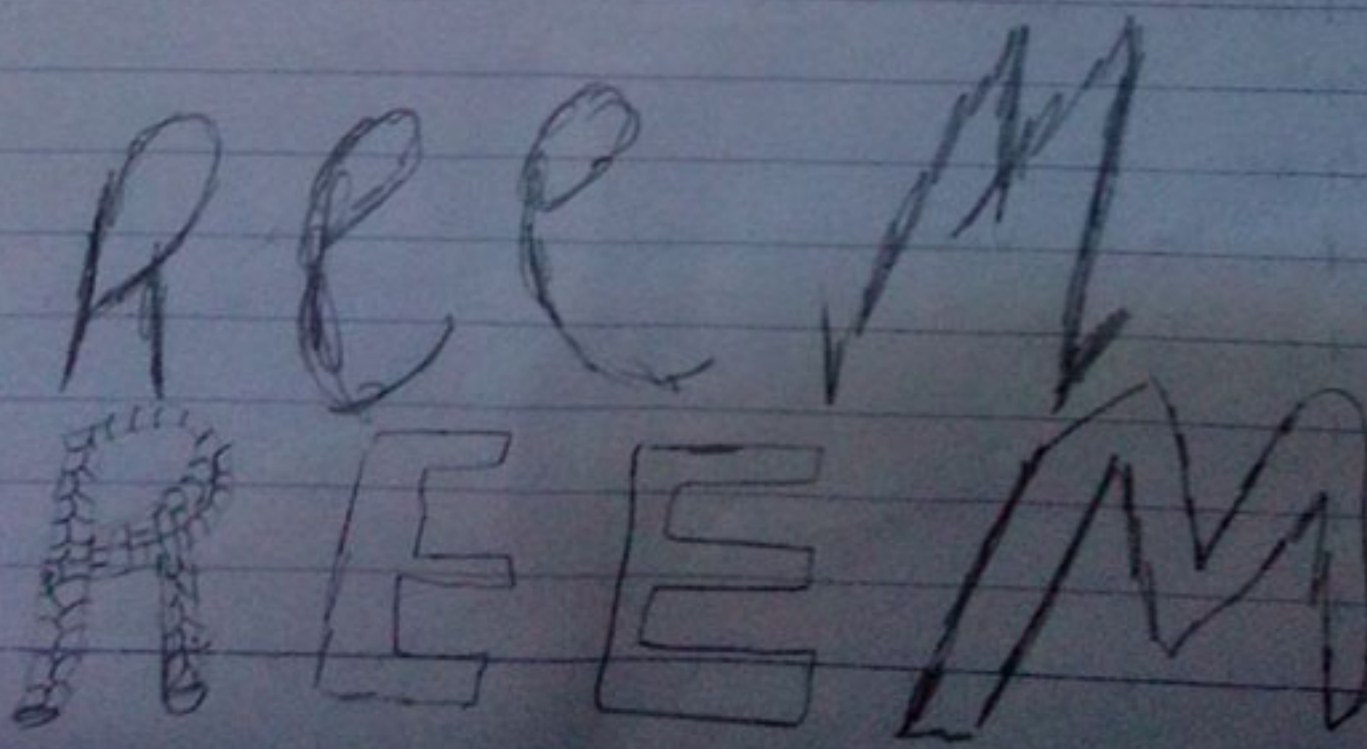
6) " " " " right " " 2? 180°

7) " does r represent in 3? radius of a circle

8) what letter is used to respresent volume in formula 4? V

9) in formula 5, if a is 4 and b is 10, what is p? $p = \frac{4}{10} \times 100 = 40$

10) How can you write formula 3 in a different way? d = 2r



Algebra

in the real world

imaging you are measuring a rectangular room. you know that the length of wall A is 3 metres. you know that the window in wall B is 400 millimetres. if the short walls either side of the window are the same length, then you don't need to measure them. there is only one unknown, so you can work out the length with, algebra.

call the length of one short wall x. if both short walls are equal, then the length of the two walls 2x. if wall A is 3 metres long then wall B must be 2x + 400 mm = 3m. However, there are different units of measurement on each side of the equation - millimetres on the left side and metres on the right. we must use a common unit on both sides. if we represent 3 m as 3,000 mm. then we can solve the equation.

take out the units of measurement, we don't need it once we have reduced both sides to common unit.

if $2X + 400 = 3000$

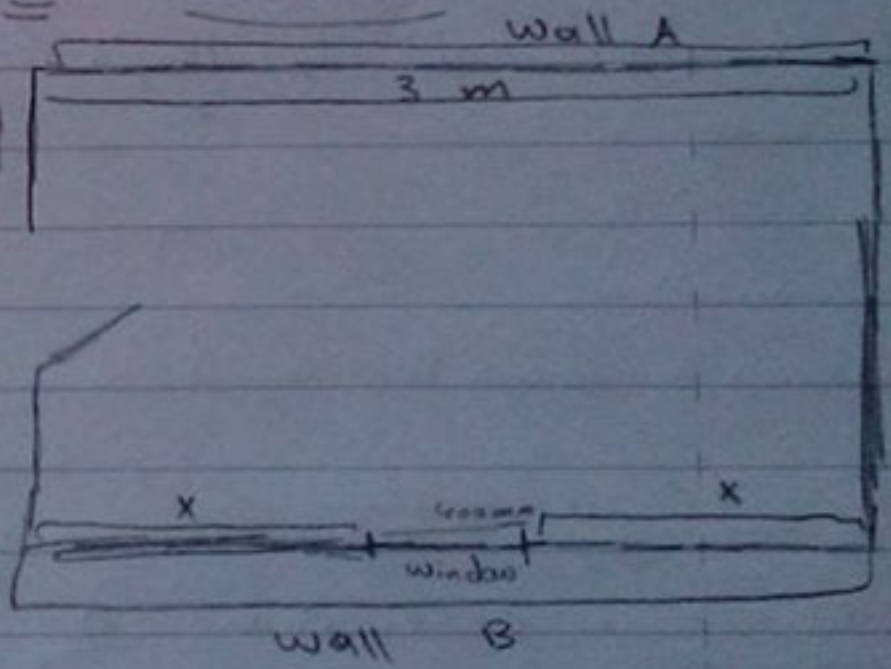
then $2X = 3000 - 400$

therefore $2X = 2600$

which means that $X = 2600 \div 2$

so $X = 1300$

so the length of each short wall must be 1300 millimetres or 1.3 metres.



Note: هذا النص الكتوبة لم تشرحه لأنو قال يا بتجيبو بالامتحان أو بتجيب نص رياضيو لكن بين الأسئلة بنط نكشات. ث

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Good Luck :)

Read text and answer:

1) wall B is:
- a 400 meters long.
- b 300 millimeters long.
- c 3000 mm long
- d 400 mm long

2) we don't need to measure the short walls because:
- a the room is rectangular
- b wall B is the same length as wall A
- c the window is 400 mm
- d there is only one unknown

3) 2x represents the length of:
- a wall A
- b wall B
- c window
- d wall B minus the window

4) we cannot solve 2x + 400 mm = 3m because:
- a there are different units of measurement
- b there are tow unknowns
- c x is millimeters on the left
- d x is meters on the right

5) we can rewrite 2x + 400 = 3000 as:
- a 2x + 3000 = 400
- b 2x = 3000 + 400
- c 2x = 3000 - 400
- d 2x = 3000 x 400

** complete the equation: Therefore and if means must so then

1 if wall A = 3000 mm and wall B = 2x + 400
2 then 2x + 400 = 3000
3 which means that 2x = 3000 - 400
4 so 2x
5 must be 2600
6 and x = 2600 ÷ 2
7 therefore x = 1300

** Find and correct mistake:

1) if the walls next to the window is equal, then you don't need to measure them.
→ are

2) if the side walls are equal, the combined length of the two walls must 1/2 x.
→ then ... be

3) so wall A is 3 meters long, then wall B must be 3 meters.
→ if

if + present simple, then + present simple

4) if we represented 3 m as 3000 mm then we can solve the equation.

5) if we are moving 400 to the other side, 3000 - 400 is 2x.
→ move ... then