Solutions

Nov 20-18:35

1. Jack planted a bean seed. He was told that, once the beanstalk was 2 m tall, it would double in height every day for 10 days. What is wrong with Jack's solution?

He has added 2m for every day instead of doubling.

Nov 27-16:37

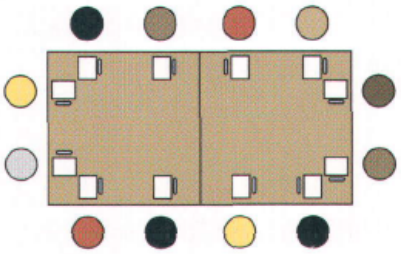
3. A checkers tournament takes seven rounds to find a winner. So, 2^7 players can enter the tournament. What is the meaning of the 7? What is the meaning of the 2?

7 - means the number of rounds.

2 - means the number of players in even match/game.

Nov 27-16:37

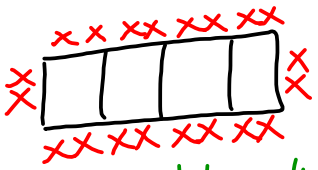
4. Square tables are arranged in rows for a parent-night presentation. Each side of a square table seats two people.



a) Draw a diagram to show how many people can sit at a row of four tables.

b) Describe a pattern for the number of people sitting at a row of n tables.

c) Use an equation to model your pattern.



# of tables x4 plus 4.

Let p = # of people and n = # of tables

$\Rightarrow p = 4n + 4$

n	p
1	8
2	12
3	16

Nov 27-16:38

6. You are planning a badminton tournament. A player who wins a match plays against another winner in the next round. A player who loses a match is eliminated.

a) How many badminton players can enter a tournament that takes four rounds to find the overall winner?

b) How many players can enter a tournament that takes n rounds?

$2^4 = 16$

2^n

Exponent

Base

Base – # players in a game/match

Exponent = # of rounds in tournament

Nov 27-16:38

8. Study the exposed smiley face cubes.

Diagram 1 Diagram 2 Diagram 3

a) Develop a formula to model the pattern.

b) What method did you use to find your formula? Justify your method.

Cubes	Smileys
2	8
3	11 (2+3)
4	14 (2+3)

Cube # x 3, then +2

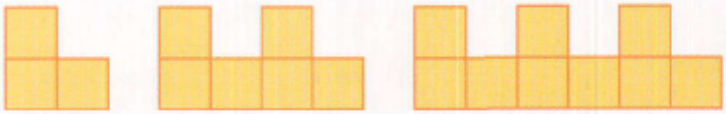
Let n = # of cubes and

S = # of exposed smileys

$\Rightarrow S = 3n + 2$

Nov 27-16:38

9. A pattern is made of centimetre squares.



a) By how much does the perimeter of the shape increase with each new L-shape?

b) Describe the relationship between the perimeter of the shape and the number of L-shapes.

c) Find the perimeter of a shape that uses 12 L-shapes.

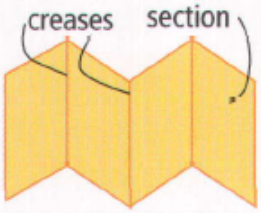
# L	Perimeter
1	8
2	14 (+6)
3	20 (+6)

b) Multiply by 6, then add 2

c) $(12 \times 6) + 2 = 74$

Nov 27-16:39

10. Start to fold a piece of paper into a fan. After each fold, open the paper and record the number of creases and sections.



a) How is the number of sections related to the number of creases?

b) Develop an equation to model the relationship.

c) What do your variables represent?

d) Justify the method you used for your investigation.

e) If your fan has 16 sections, how many creases will it have? Explain.

Creases	Sections
1	2
2	3
3	4

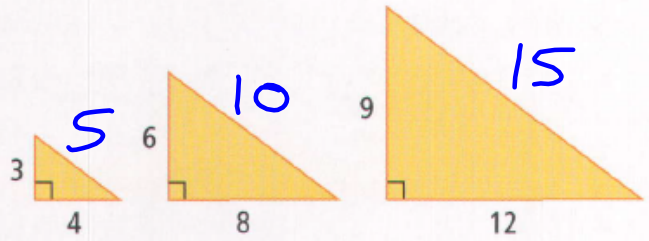
Let s = # sections and c = # creases

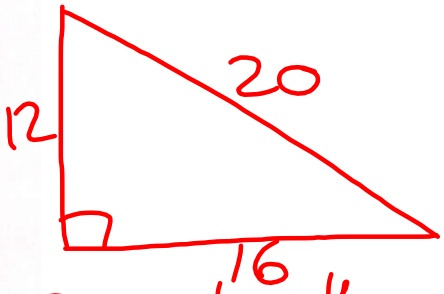
$s = c + 1$

15 creases. $[c = s - 1]$

Nov 27-16:39

11. a) Find the length of the hypotenuse of each right triangle.

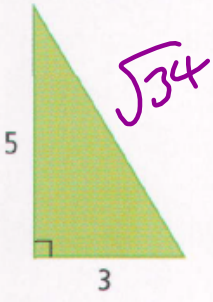


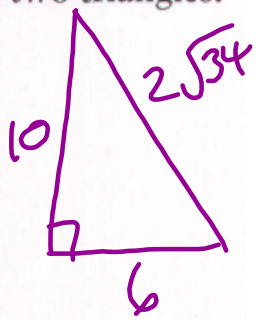


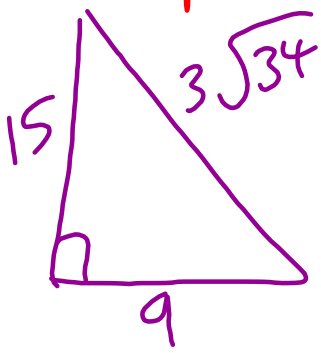
b) How are the triangles related? Identify the pattern and extend it to show one more triangle.

Side length multiplied by pattern position

c) Create a similar pattern beginning with this triangle. Show the next two triangles.







Nov 27-16:40

12. Fernanda read about a cool Web site in her science book. She e-mails three friends to tell them about the site. Each of her friends e-mails three other friends and so on. How many levels of e-mails are needed to tell 1000 people?

$3^n = 1000$

$3^1 = 3$
$3^2 = 9$
$3^3 = 27$
$3^4 = 81$
$3^5 = 243$
$3^6 = 729$
$3^7 = 2187$

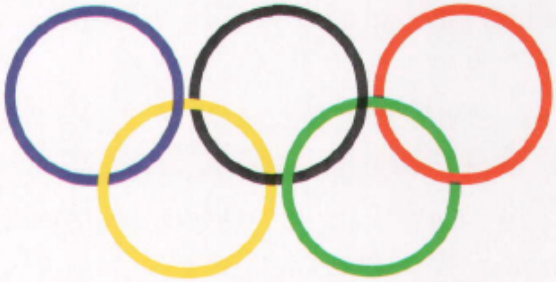
6 levels are not enough

$\Rightarrow$ 7 levels needed

Nov 27-16:40

Try This!

13. Look at the Olympic symbol.



a) Describe the relationship between the number of circles and the number of intersection points. How can the pattern be extended?

b) If the pattern is extended to a total of 100 circles, how many points of intersection will there be?

c) Create your own patterning problem. Ask a classmate to model your pattern using an equation.

Circles	Intersections
1	0
2	2
3	4
4	6
5	8

$I = 2c - 2$

100 circles

$I = 2(100) - 2$

$I = 198$

Nov 27-16:41

14. Dr. Fournier wants to hire a student to walk dogs for her veterinary clinic. Two students apply for the job. Chandra charges $5 per dog. Sylvie charges $10 for the first dog and $3 for each additional dog.

a) How much does each student charge to walk one dog? two dogs?

b) Who should Dr. Fournier hire to walk the dogs? Why? Will Dr. Fournier change her mind depending on the number of dogs at the clinic? Explain.

Dogs	Chandra	Sylvie
1	5	10
2	10	13
3	15	16
4	20	19
5	25	22
n	5n	3n + 7

+5 +5 +5 +3 +3

3 dogs or fewer choose Chandra.
4 or more use Sylvie

Nov 27-16:41