

# Short mixed problems.

For 13,14,15 yr old students.

## Series 4.

**Monday:**

### The 10 Dollar Question.

Find the next number in the sequence

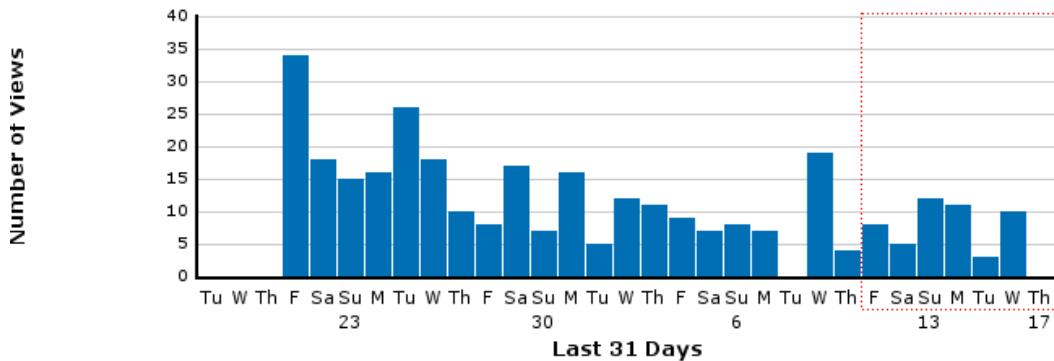
1    1    2    3    5    8

### The 20 Dollar Question.

Which number when added to fifteen, gives the same result as if it were multiplied by six?

### The 30 Dollar Question.

The graph shows the number of views on a house and property advertised on the internet site called "Open to View" . Calculate the mean number of views on the house over the 27 day period it was advertised. Give your answer to the nearest whole number.



## The 40 Dollar Question.

How long would it take Jono to save to buy this Qoolquee Cool MP4 player? He can save \$23 each week from his job delivering papers.

It is 1GB, and a 1.5 inches LCD screen.

It supports video, has an English-Chinese Dictionary, has funny electronic games, has a built in removable pen drive, and USB mass storage.

The price is \$120.



## The 50 Dollar Question.

When your teacher's parents were at school the measure for an area of land was an acre.

There were 4 roods to an acre,

10 square chains to an acre,

and 16 square rods to a square chain.

How many square rods were there to a rood?

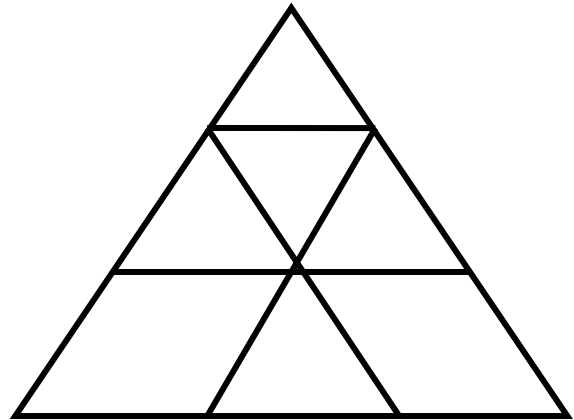


Fig. 1. The determination of a "right and lawful rod" or rod in the early sixteenth century in Germany by measuring an essentially random selection of 16 men as they leave church.

**Tuesday:**

**The 10 Dollar Question.**

How many triangles can you see in this diagram?



**The 20 Dollar Question.**

Three people have eaten a scrumptious meal in a restaurant. The account comes to \$30. Each person gives a \$10 note to the waiter. The waiter takes the account with the money to the manager. The manager calculates that he has overcharged so he gives the waiter \$5 to take back to the people. On the way back the waiter dishonestly pockets \$2 of the \$5 for himself. He then gives each of the people \$1 back only. This means that each person has now paid \$9 for the meal. Now the people have paid a total of \$27 and the waiter has pocketed \$2. This total is \$29. But the people had paid originally \$30.



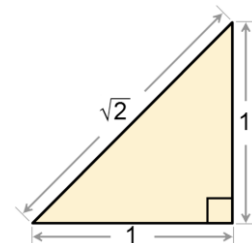
What has happened to the missing \$1 ?

- (a) The manager has it.
- (b) The waiter has got it and added it to the \$2 he dishonestly pocketed.
- (c) One of the people who dined has it.
- (d) The cook has it.
- (e) There is not \$1 left over or missing. No one has it.

**The 30 Dollar Question.**

Which of these numbers is closest to the square root of 2 ?

- (a) 1.4142135623
- (b) 1.4141135623
- (c) 1.4143135623
- (d) 1.4144135623

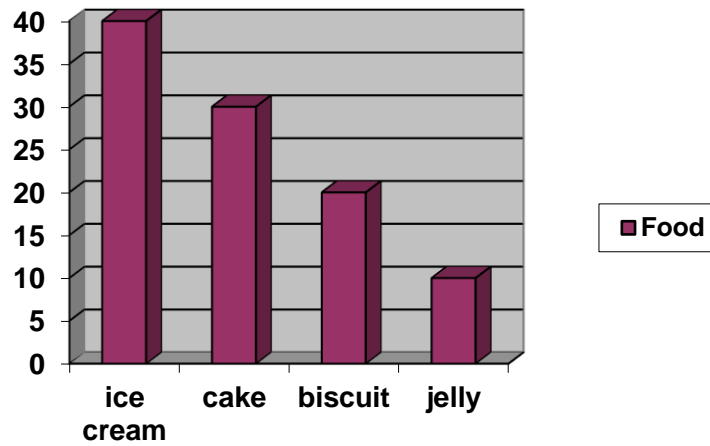


## The 40 Dollar Question.

What type of statistical graph is this?

Is it a

- (a) cumulative graph
- (b) column graph
- (c) line graph
- (d) bar graph
- (e) histogram.



## The 50 Dollar Question.

*I'm a two-digit prime and no more.  
My digits subtracted is plus 4;  
Their sum is but 10.  
I say to you then,  
To find me is not a big chore.*

What number am I ?



**Wednesday:**

### **The 10 Dollar Question.**

The number of diagonals in a triangle is 0.  
The number of diagonals in a square is 2.  
The number of diagonals in a pentagon is 5.  
The number of diagonals in a hexagon is 9.  
How many diagonals are there in a 10 sided polygon?



### **The 20 Dollar Question.**

Betty invests her savings of \$100 in the Kiwibank for 1 year.  
The Kiwibank gives an interest of 8% on her savings.  
How much does Betty receive when she withdraws her savings at the end of the year?  
Give your answer to the nearest dollar.



### **The 30 Dollar Question.**

Beryl is the manager of the shoe shop Shoes 4 U in Queen street. She wants to know, what is the most common size of shoe people wear when they are walking past her shop. She gets Tom her husband to survey people and write down their shoe size when they walk past the shop on a Friday. What type of average will Beryl need to know to answer her question?

- (a) mean
- (b) median
- (c) mode
- (d) frequency
- (e) standard deviation.



**Art work is by Beryl Cook O.B.E.**

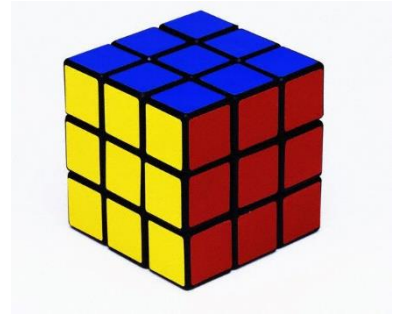
## The 40 Dollar Question.

Finding the “Taxi Cab Number”.

It is the smallest number that can be written as the sum of two cubes in two different ways.

$$12^3 + 1^3 \text{ or } 10^3 + 9^3$$

What number is called the “Taxi Cab Number”?



## The 50 Dollar Question.

A famous English mathematician G.H.Hardy once wrote when visiting a friend in hospital.

*“... I remember once going to see him when he was lying ill in Putney Hospital. I had ridden in taxi-cab number 1729 and remarked that the number seemed to me to be a rather dull one, and that I hoped it was not an unfavourable omen.*

*“No”, the friend answered, “it is a very interesting number. It is the smallest number that can be expressed as the sum of two cubes in two different ways.”*

Who was the friend in hospital?

He became one of the most famous mathematicians in the world.



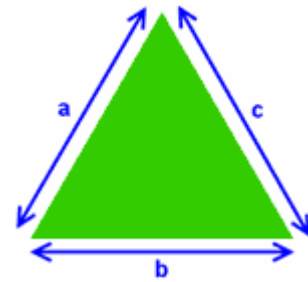
**Thursday:**

**The 10 Dollar Question.**

The area of a triangle can be calculated by using the very old formula

$$A = \sqrt{s \cdot (s - a) \cdot (s - b) \cdot (s - c)}$$

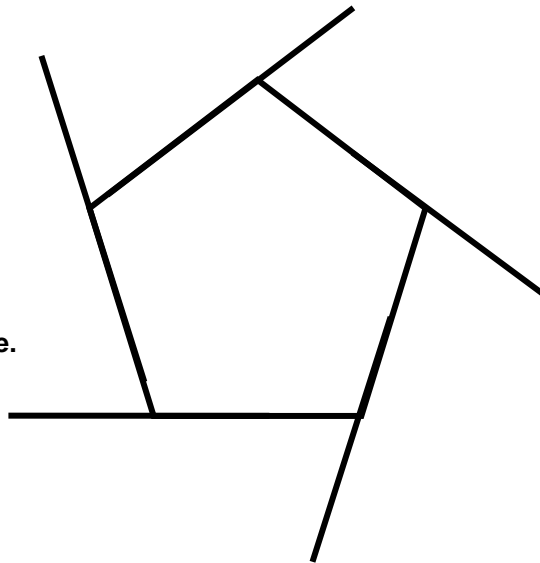
where  $s$  is the value of half the perimeter and  $a, b, c$  are the lengths of the sides.



Calculate the area of the equilateral triangle with side 4 cm.  
Give your answer in square centimetres to one decimal place.

**The 20 Dollar Question.**

A regular pentagon is a shape with five equal sides.  
It also has five exterior angles, all of which are equal.  
Calculate the value of each exterior angle.



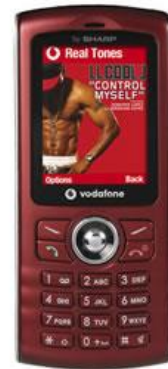
**The 30 Dollar Question.**

The mean weight of four cats is 15kg.  
Another cat called Smoky is added to the gang!  
Smoky weighs 5kg.  
What is now the mean weight of our cat gang?



## The 40 Dollar Question.

The cash price of a Sharp GX17 Vodafone is \$180.  
Jordan decides to buy it on hire purchase. It will cost her \$18 per month for 12 months.  
How much extra does she have to pay?



## The 50 Dollar Question.

Chelsea's perfect partner has black hair, blue eyes and is short.  
She knows four possible partners.  
William has blue eyes, is tall and has black hair.  
Henry is short like Harry but has beautiful brown eyes.  
William, Henry and Harry all have black hair.  
Duke and William are both tall.  
Harry has steely blue eyes.  
Duke has blue eyes and no hair.  
Who is Chelsea's perfect partner?





**Friday:**

**The 10 Dollar Question.**

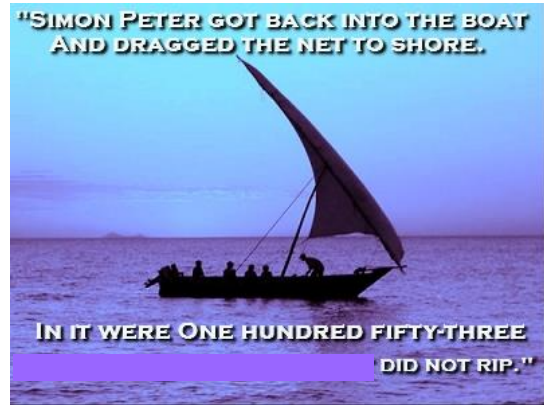
Find the number!

It is equal to  $1! + 2! + 3! + 4! + 5!$

It is also equal to  $1^3 + 5^3 + 3^3$

In the New Testament from the Bible it is also the number of fish that Simon Peter drew from the sea of Tiberius.

John 21:11 reads, "Simon Peter got back into the boat and dragged the net to shore. In it were ----- large fish, but still the net did not rip."

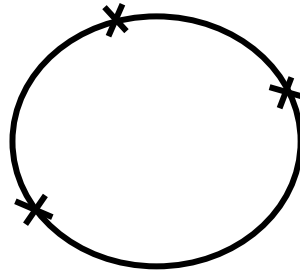


**The 20 Dollar Question.**

Three points which lie on the circumference of a circle are called by this name.

- (a) circular
- (b) concyclic
- (c) cyclic
- (d) circumcyclic
- (e) circumference

Which one is it?



**The 30 Dollar Question.**

Shelley was shelling peas for her mother last week. She made a statistical table of the peas that were in each pod she shelled.

|                          |    |    |    |    |   |   |
|--------------------------|----|----|----|----|---|---|
| Number of peas in a pod. | 3  | 4  | 5  | 6  | 7 | 8 |
| Number of pods.          | 12 | 17 | 25 | 16 | 6 | 3 |



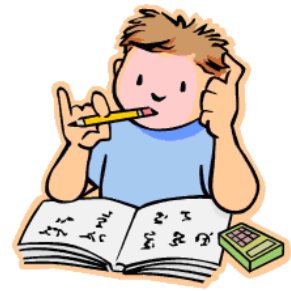
What was the median value of peas in the pods that Shelley shelled?

## The 40 Dollar Question.

To encourage Kaden to get more answers correct with his maths homework his Dad agreed to pay him 10 cents for every question Kaden got correct. For every answer which wasn't correct Kaden had to pay his Dad 20 cents.

On Wednesday there were 30 problems for homework and Kaden earned \$1.50 .

How many problems did he get correct?



## The 50 Dollar Question.

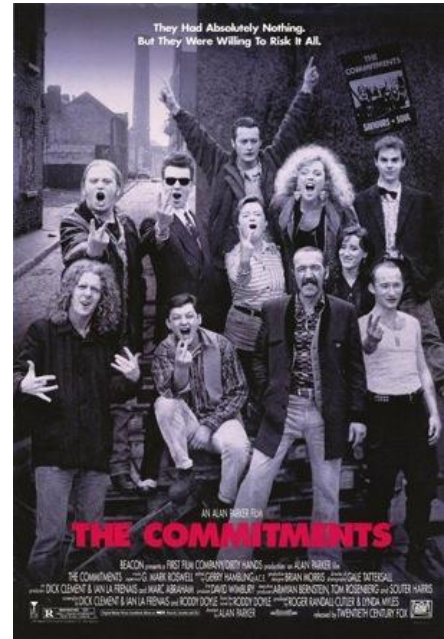
*“Alright folks we’ve doone good work here tonight.  
Will you all foorm a circle please.  
You too Jimmy.  
Corme on, corne on, just foorm a circle.  
Now, everybody, tuurn right.  
Now lets pat ourselves on the back for a job well doone.”*

This is from the soundtrack of a well known movie.  
The movie was made in 1991 and it has often been shown on television.

In the movie the 10 members of the band form a circle around the leader and pat each other on the back – for “a job well done”!

What could the radius of the circle be?

Give your answer in metres correct to one decimal place.



## Answers.

## Series 4.

## Level 5

|               |              |
|---------------|--------------|
| <b>Monday</b> |              |
| 10 Dollar     | 13           |
| 20 Dollar     | 3            |
| 30 Dollar     | 12           |
| 40 Dollar     | 6 or 6 weeks |
| 50 Dollar     | 40           |

|                |    |
|----------------|----|
| <b>Tuesday</b> |    |
| 10 Dollar      | 9  |
| 20 Dollar      | e  |
| 30 Dollar      | a  |
| 40 Dollar      | d  |
| 50 Dollar      | 73 |

|                  |              |
|------------------|--------------|
| <b>Wednesday</b> |              |
| 10 Dollar        | 35           |
| 20 Dollar        | 108 or \$108 |
| 30 Dollar        | mode or c    |
| 40 Dollar        | 1729         |
| 50 Dollar        | Ramanujan    |

|                 |            |
|-----------------|------------|
| <b>Thursday</b> |            |
| 10 Dollar       | 6.9        |
| 20 Dollar       | 72 or 72°  |
| 30 Dollar       | 13 or 13kg |
| 40 Dollar       | 36 or \$36 |
| 50 Dollar       | Harry      |

|               |               |
|---------------|---------------|
| <b>Friday</b> |               |
| 10 Dollar     | 153           |
| 20 Dollar     | conyclic or b |
| 30 Dollar     | 5             |
| 40 Dollar     | 25            |
| 50 Dollar     | 1.6           |

## **Teacher Comments.**

**Five mixed problems every day for a week!**

**Some are easy some are difficult.**

**Each day the problems involve logic, statistics, numbers, geometry, money.**

**The Dollar Value creates student interest for each day.  
The total for each day is \$150.**

**It also gives an indication of the difficulty of the problem!**

**There are 6 series of problems for a week for each age group of students,  
13,14,15 year olds, 12,13 year olds, 10,11 year olds.**

**The answers are correct!!  
Use this section in anyway you wish!**

