IMPROVING REASONING ABILITY FOR EXAMS Part-3

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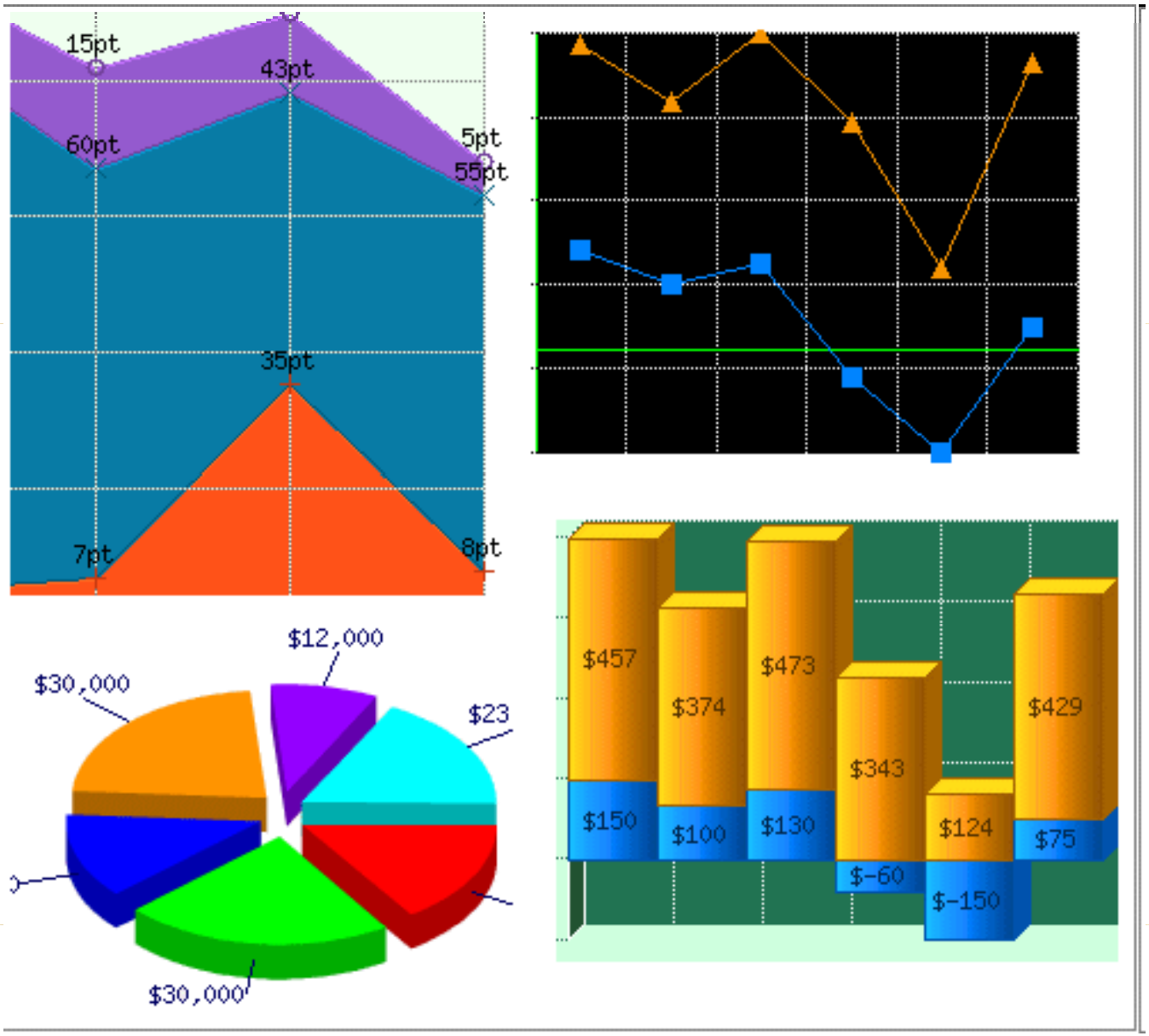
Chart gallery

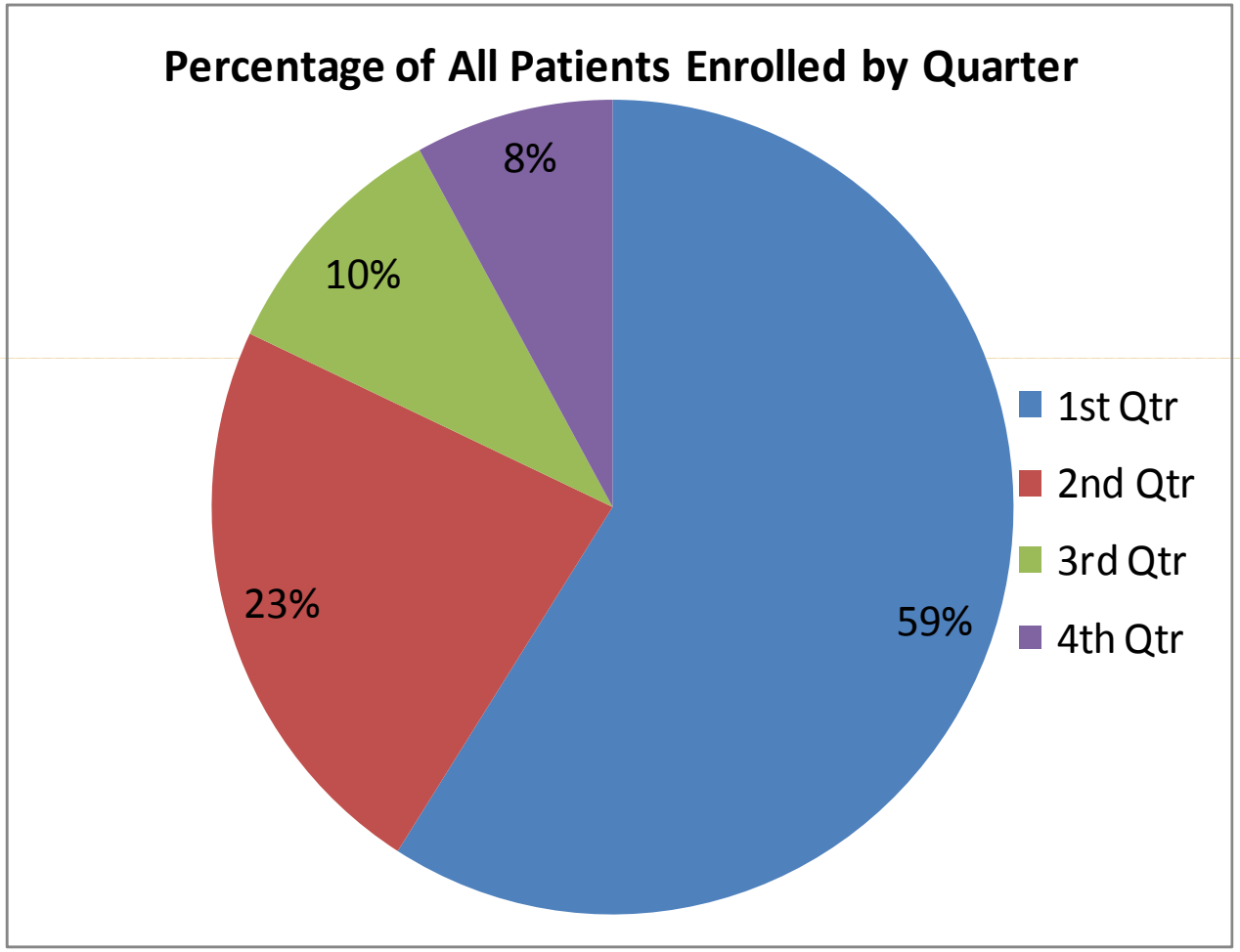
- https://developers.google.com/chart/interactive/docs/gallery

Chart Types and Their Uses



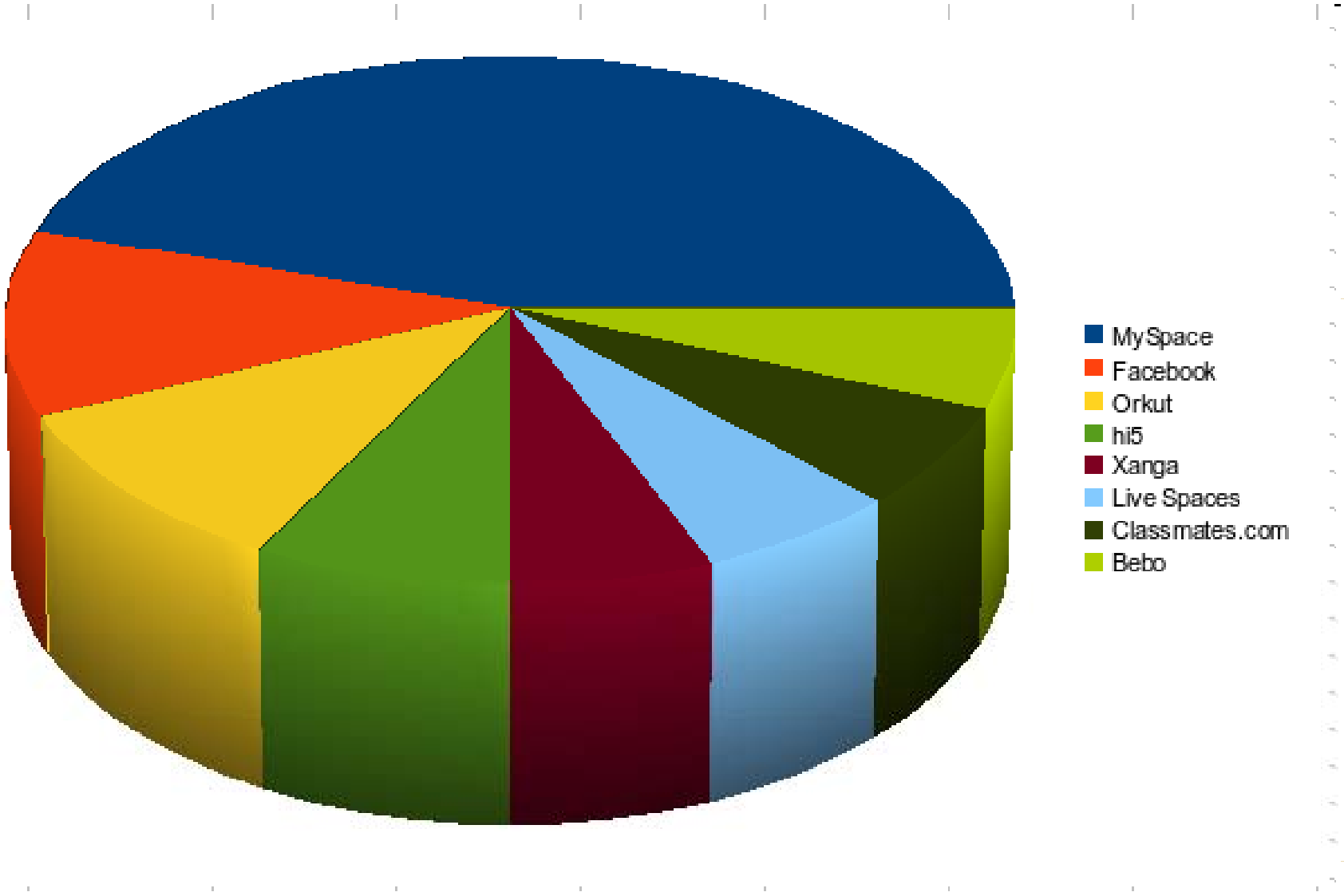
Pie chart

Contribution to the total = 100%



N=150

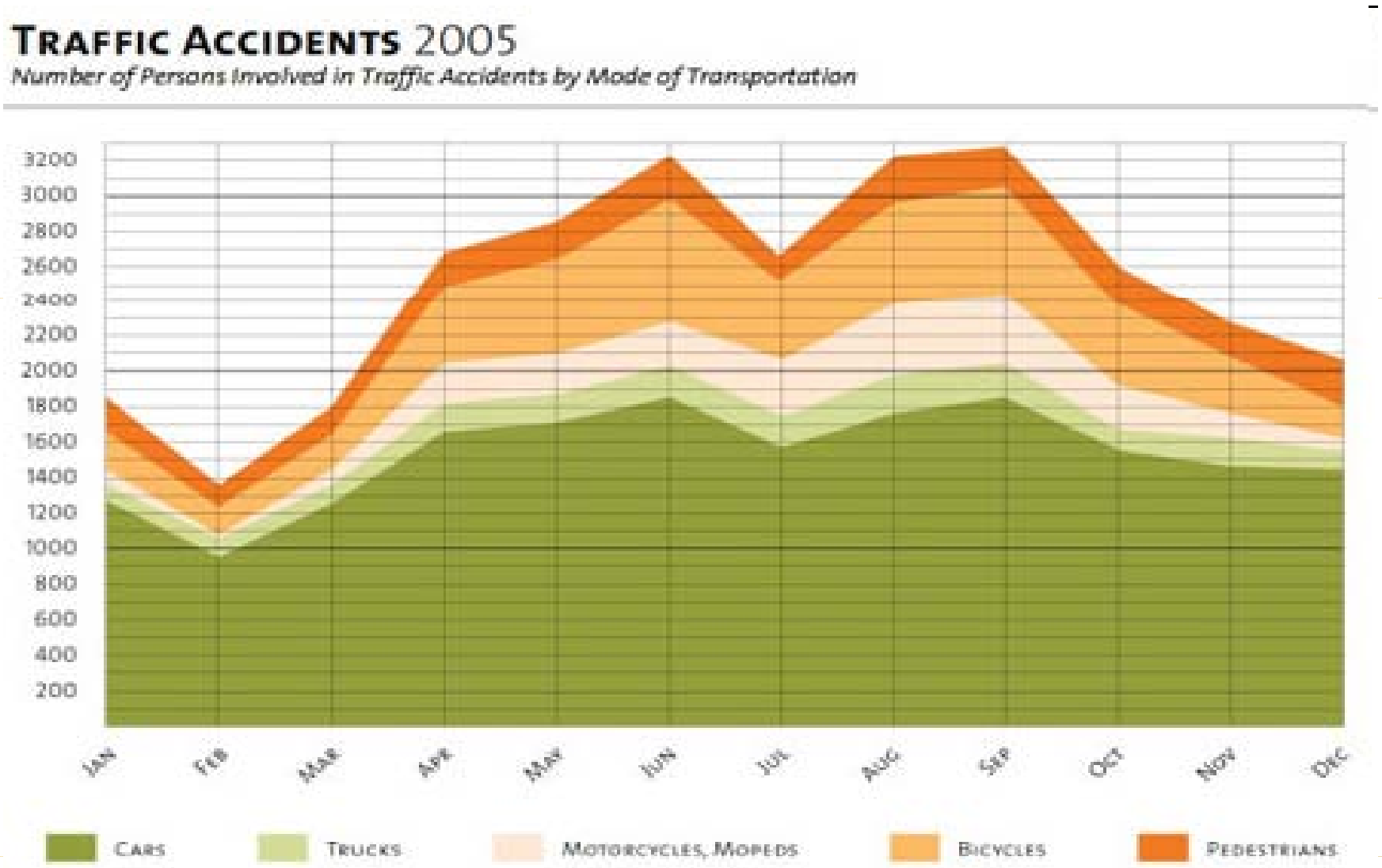
Pie Chart


MySpace
Facebook
Orkut
hi5
Xanga
Live Spaces
Classmates.com
Bebo

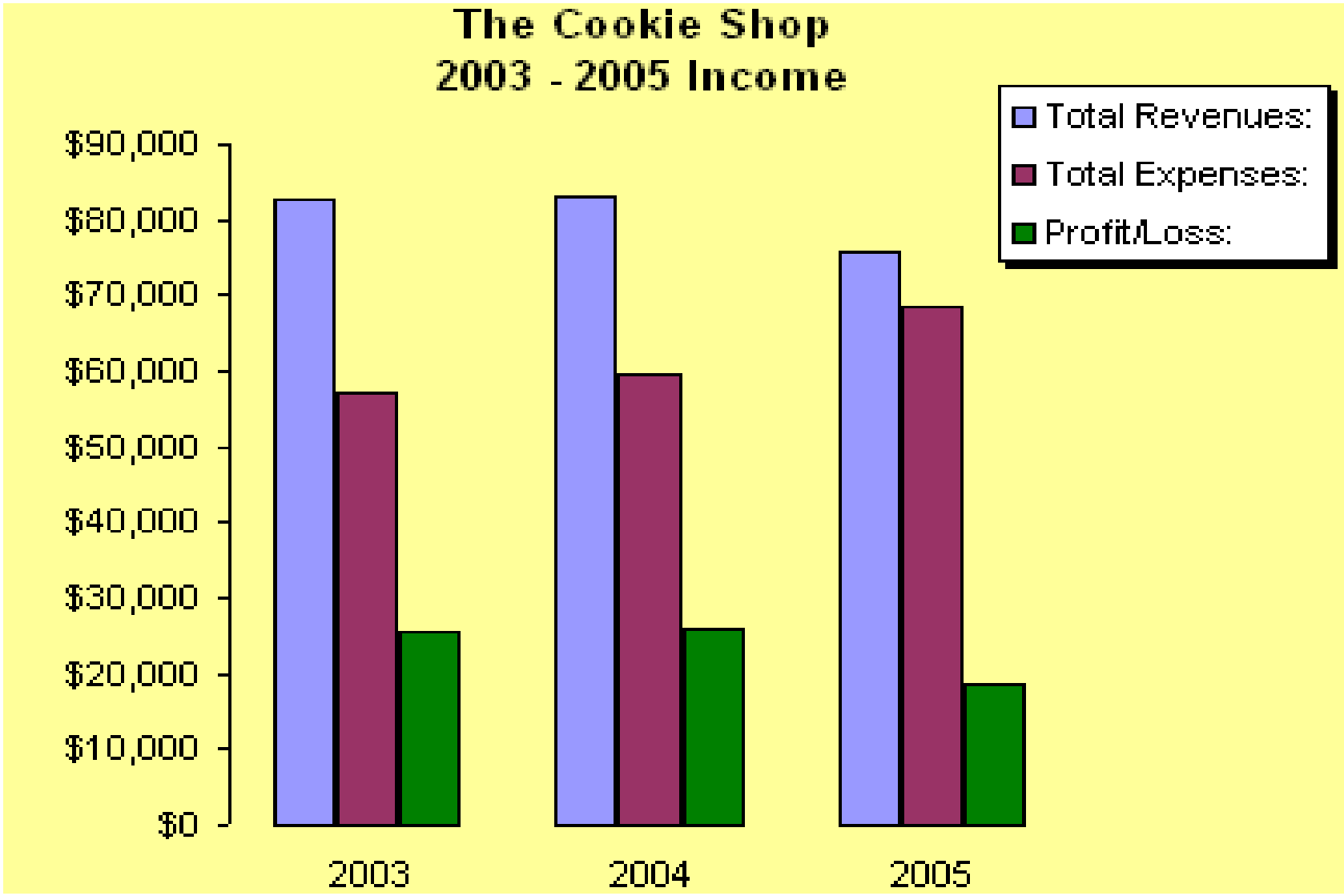
Caution!

- Pie charts cannot represent values beyond 100%
- Each pie chart is valid for one point in time only
- Pie charts are only suited to presenting quite a few percentage values
- Angles are harder to estimate for people than distances; perspective pie charts are even harder to interpret

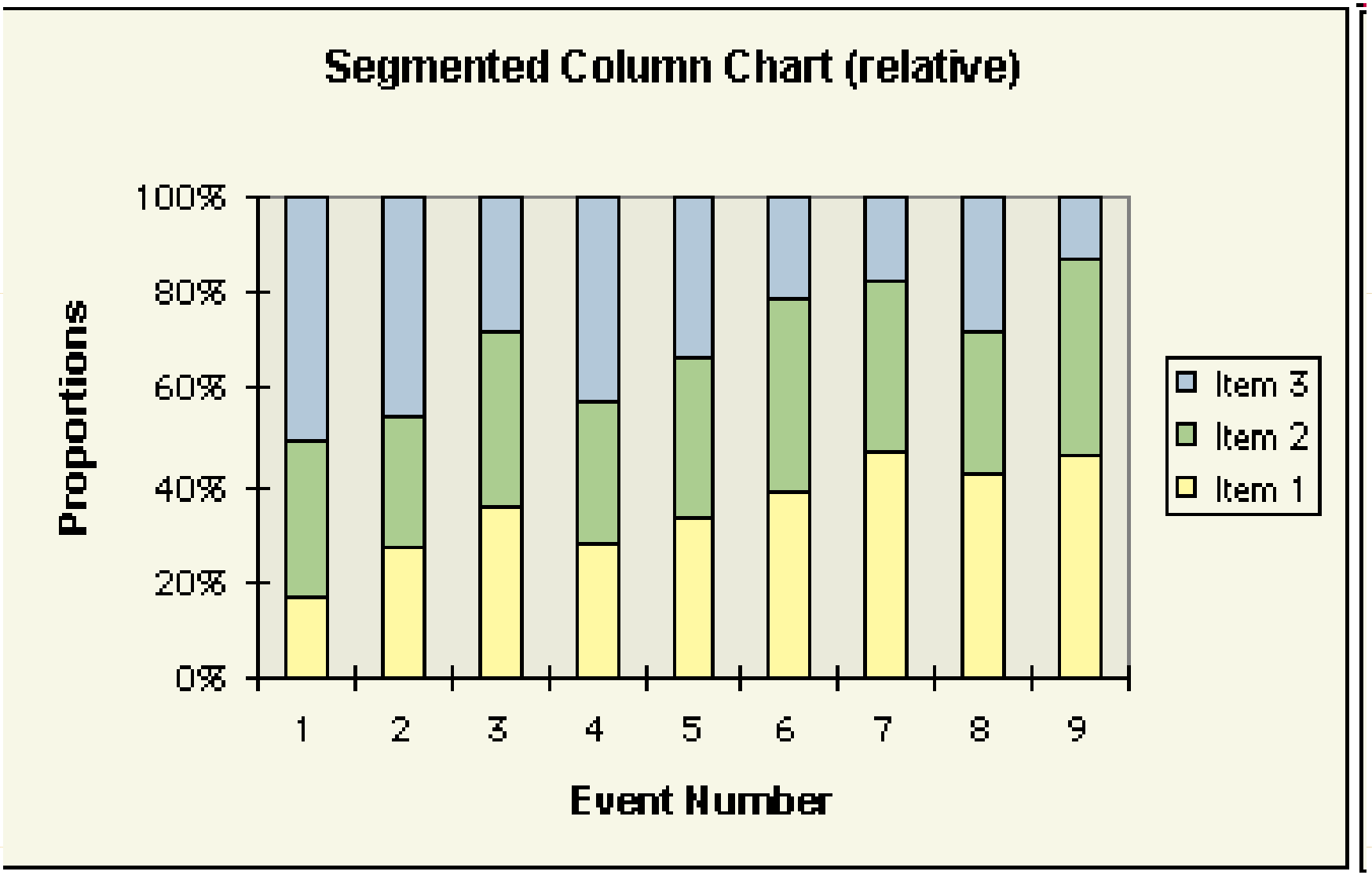
AREA CHARTS


TRAFFIC ACCIDENTS 2005
Number of Persons Involved in Traffic Accidents by Mode of Transportation
3200
3000
2800
2600
2400
2200
2000
1800
1600
1400
1200
1000
800
600
400
200
JAN
FEB
MAR
APR
MAY
JUN
JUL
AUG
SEP
OCT
NOV
DEC
CARS
TRUCKS
MOTORCYCLES, MOPEDS
BICYCLES
PEDESTRIANS

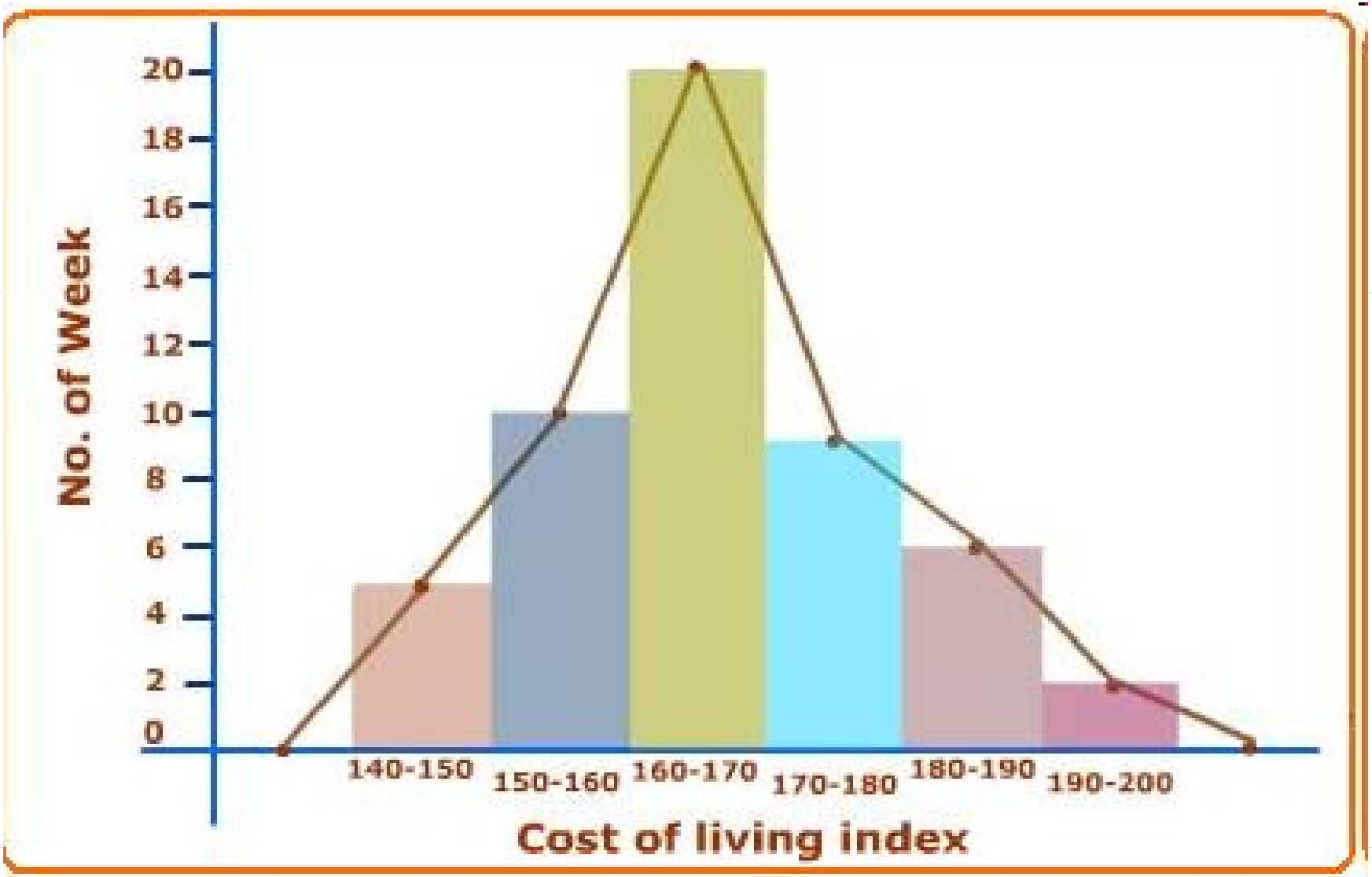
Column/Bar Chart



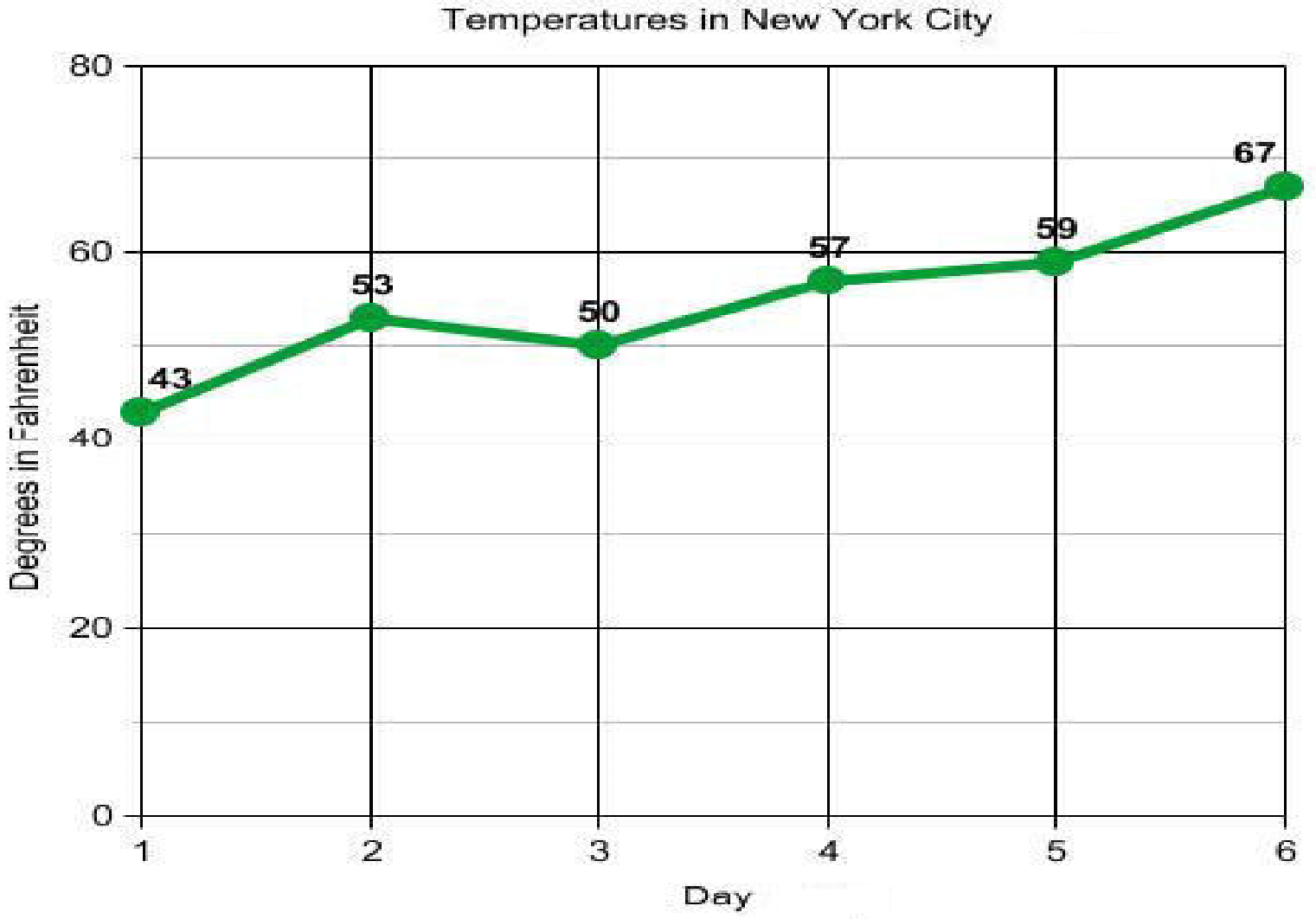
Segmented Column/Bar Chart



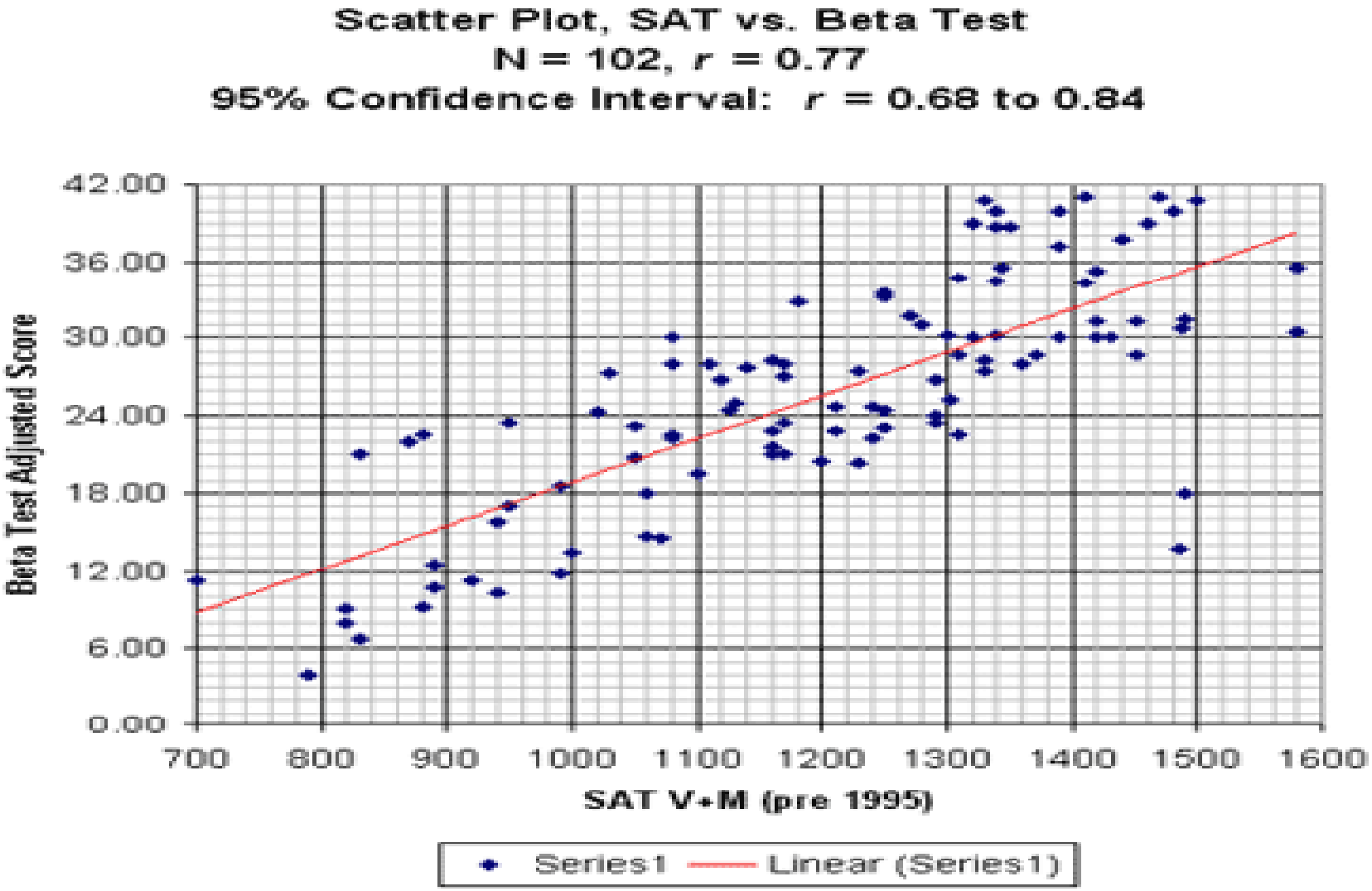
Frequency Polygon, Histograms



Line Chart/Graph

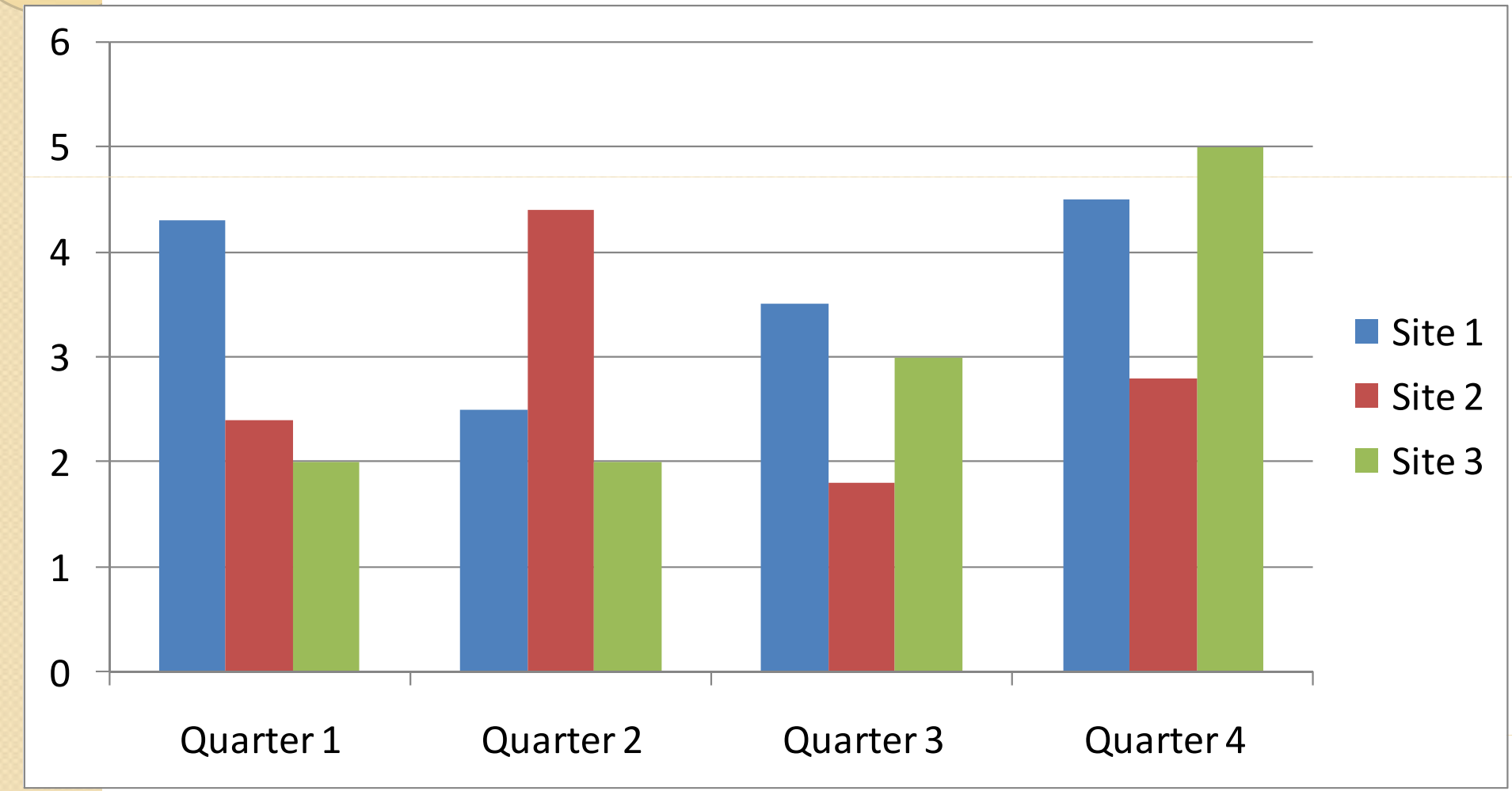


Scatterplot

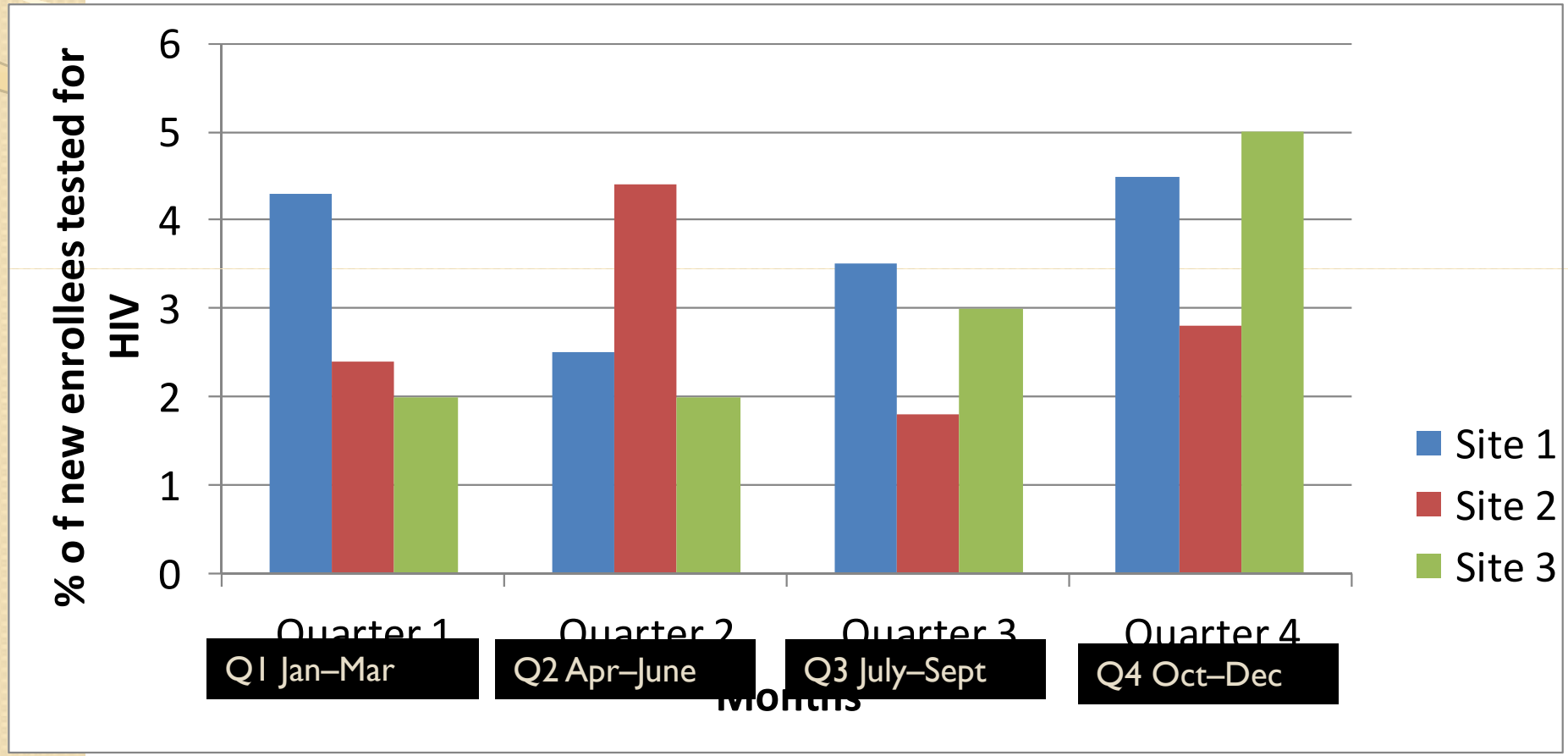


Bar chart

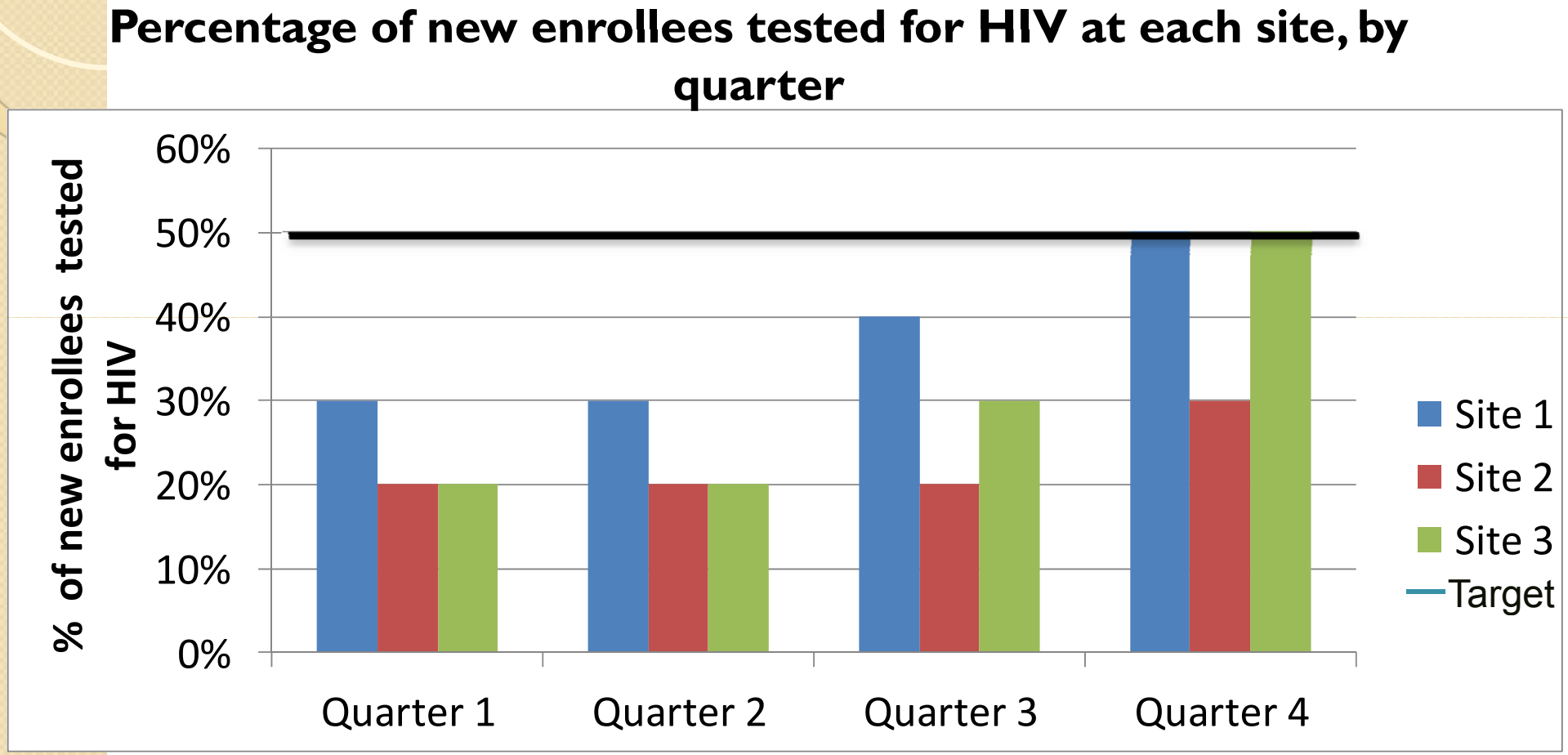
Comparing categories



Percentage of new enrollees tested for HIV at each site, by quarter

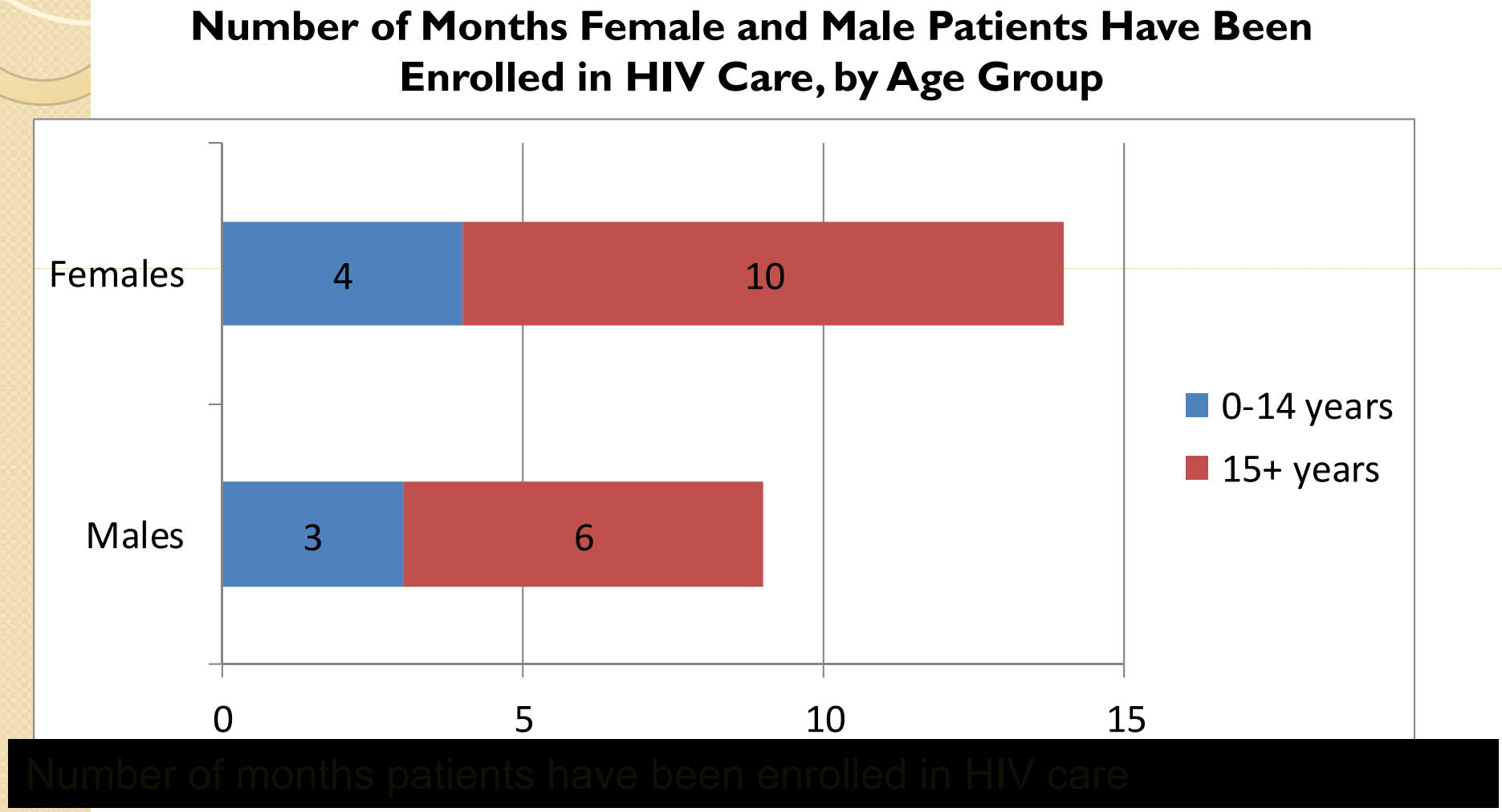


Has the program met its goal?



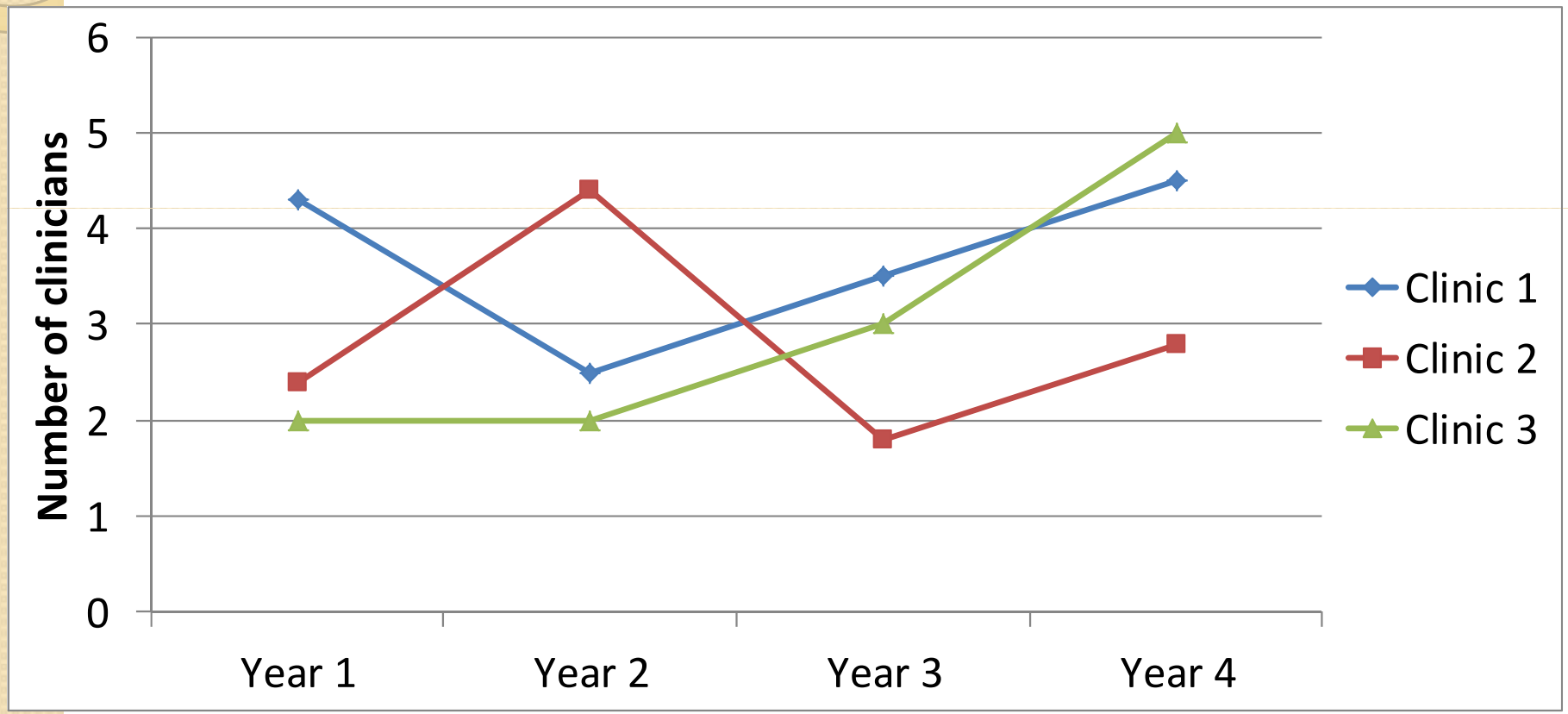
Stacked bar chart

Represent components of whole & compare wholes

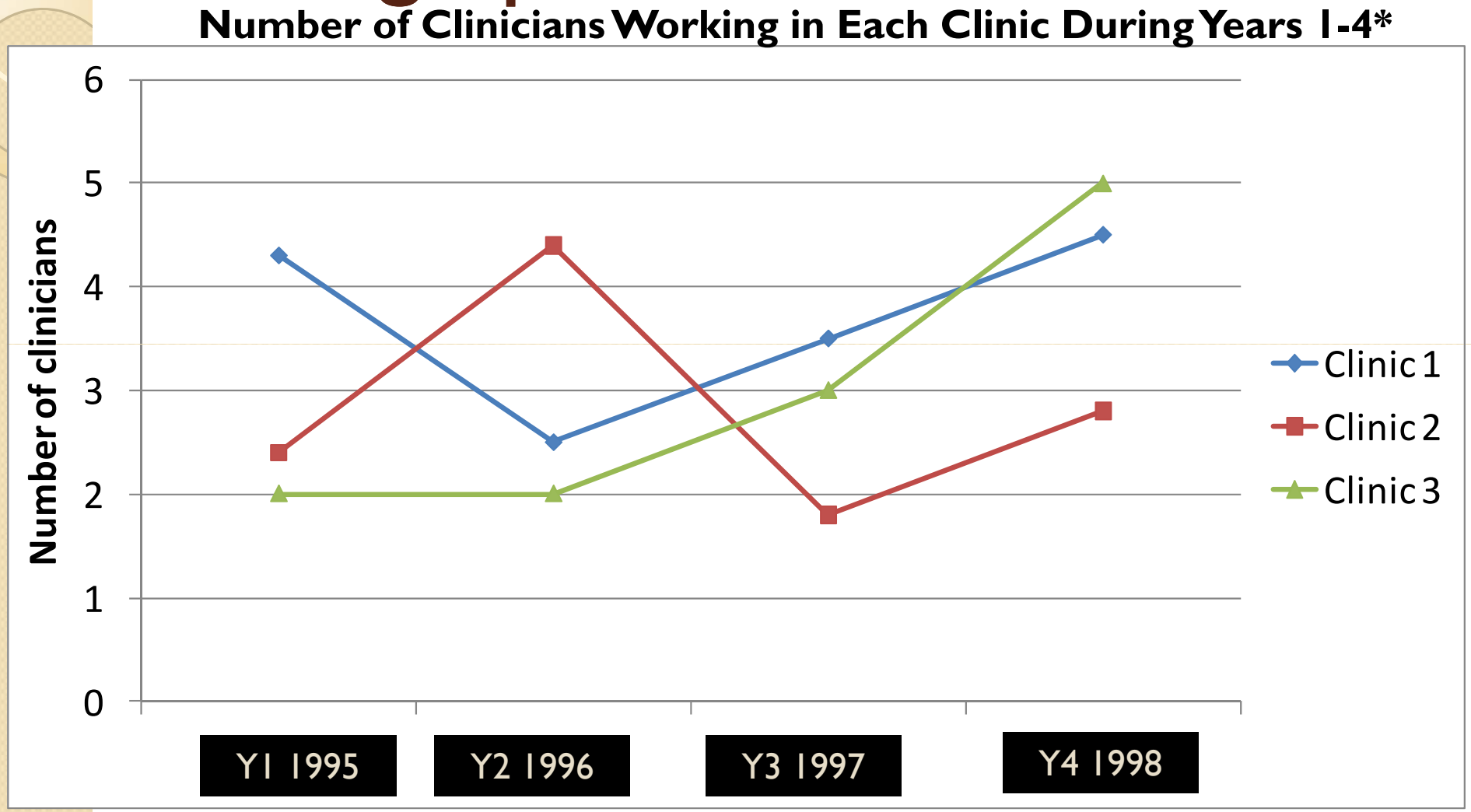


Line graph

Displays trends over time



Line graph


Number of Clinicians Working in Each Clinic During Years 1-4*
Number of clinicians
6
5
4
3
2
1
0
Y1 1995
Y2 1996
Y3 1997
Y4 1998
Clinic 1
Clinic 2
Clinic 3

Numerical Ability exercises

Question 1 :

Phone Company A charges 50 + 3x dollars for an international phone plan, where x is the number of minutes spent talking. Phone Company B charges 60 + 2x dollars for an international phone plan, where x is the number of minutes spent talking. What is the price at which both companies charges the same amount?

- (A) $10 (B) $20 (C) $30 (D) $80 (E) $110
- **Answer :**
- Charge of company A = 50 + 3x
- Charge of company B = 60 + 2x
- 50 + 3x = 60 + 2x
- 3x - 2x = 60 - 50
- x = 10 (Number of minutes)
- Charge of company A = 50 + 3(10)
- = 50 + 30
- = $80
- Hence the price is $80.

Question 2:

- On a blueprint of a school 1/4 cm represents 24 m. If the cafeteria is 60 m long, what is its length, in cm, on the blue print ?
- (A) 3/8 (B) 5/8 (C) 3/4 (D) 1 ¼ (E) 2 ½
- **Answer :**
- 24 m = 1/4 cm
- Divide by 24 on both sides
- 1 m = (1/4) / (24) cm
- 1 m = 1/96 cm
- 60 m = 60(1/96) cm
- = (60/96) cm
- = (5/8) cm

Question 3 :

- Suresh's average score after 3 tests is 88. What score on the 4^{th} test would bring Suresh's average upto exactly 90?
- (A) 92 (B) 93 (C) 94 (D) 95 (E) 96
- **Answer :**
- Sum of 3 test scores = 3 (88) = 264
- Sum of 4 test scores = 4(90) = 360
- 4^{th} test score = 360 - 264
- = 96
- Hence 4^{th} test score is 96.

Question 4 :

Find the next term in the series :

0, 1, 1, 2, 4, 7, 13, 24,.....

(A) 28 (B) 37 (C) 44 (D) 48 (E) 81

Solution :

By adding the preceding three terms, we get the next term.

4^{th} term = 0 + 1 + 1 ==> 2

5^{th} term = 1 + 1 + 2 = 4

6^{th} term = 1 + 2 + 4 = 7

In this way, we will get the

9th term = 7 + 13 + 24 ==> 44

Hence the required term is 44.

Question 5 :

After a 10% increase, a population was 55. What was the population before the increase ?

(A) 54.45 (B) 55.45 (C) 50 (D) 56 (E) 10

Solution :

Let x be the original population

$x + 10\% \text{ of } x = 55$

$x + 0.10x = 55$

$1.01x = 55$

$x = 55 / 1.01$

$x = 54.45$

Question 6 :

A substance's length doubles every hour. At 2 PM it was 3 meters. What was the length at 12 PM that same day?

(A) 0.375 meters (B) 0.5 meters (C) 0.75 meters

(D) 1 meter (E) 1.5 meters

Solution :

By writing the length of substance from 2 PM as sequence, we get

At 1 PM, the length of substance = $(1/2)(3)$

At 12 PM, the length of substance = $(1/2)^2 3$

3/4 = 0.75 meters

Question 7 :

Linda scored 66, 82, 81 and 92 on her English exams. What score must Linda obtain on the next math test, to have an average of exactly 84 ?

(A) 84 (B) 87 (C) 95 (D) 99 (E) 100

Solution :

Linda's marks are 66, 82, 81 and 92.

Average of 5 marks = 84

Let "x" be the unknown score in English

$(66 + 82 + 81 + 92 + x)/5 = 84$

$321 + x = 84\ (5)$

$321 + x = 420$

$x = 420 - 321$

$x = 99$

Hence Linda has to score 99 marks in the next test to get the average 84.

Question 8 :

If today is Saturday, what day of the week will it be in 365 days from now?

(A) Monday (B) Tuesday (C) Thursday

(D) Friday (E) Sunday

Solution :

The problem starts with Saturday, every 7 days from Saturday, it will be Saturday.

By dividing 365 by 7, we get 1 as remainder. So the answer will be 1 day after Saturday.

Hence the answer is Sunday.

Question 9 :

If the average of 11 numbers is 15, then what is the sum of these 11 numbers ?

(A) 324 (B) 350 (C) 155 (D) 165 (E) 174

Solution :

Average of 11 numbers = 15

Sum of 11 numbers/11 = 15

Sum of 11 numbers = 15(11) = 165.

Hence the required answer is 165.

Question 10 :

How many prime numbers are between 4 and 16 inclusive ?

(A) 2 (B) 3 (C) 4 (D) 5 (E) 6

Solution :

4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16

Prime numbers are 5, 7, 11, 13

Hence there are 4 prime numbers between 4 and 16.

Question 11 :

How many perfect squares are between 9 and 25 exclusive ?

(A) 0 (B) 1 (C) 2 (D) 3 (E) 4

Solution :

9, 16, 25

Hence the number of perfect square between 9 and 25 is 1.

Question 12 :

Ramu travels at the rate of 30 km per hour for 4 hours. He then returns over the same route in 3 hours. What was his average rate for the return trip, in km per hour ?

(A) 22 1/2 (B) 34 2/7 (C) 35 (D) 36 (E) 40

Solution :

Speed = 30 km per hour

Time taken for travelling = 4 hours

Time = Distance / speed

4 = Distance/30

Distance = 30(4) = 120 km

Now, we have to find the speed taken by him to cover the the same distance that is 120 km in 3 hours.

3 = 120/Speed

Average speed = 120/3 = 40 km per hour

Question 13 :

The value of $3^5 + 3^5 + 3^5$ is

(A) 3^6 (B) 3^{15} (C) 9^5 (D) 9^{125} (E) 4^5

Solution :

$3^5 + 3^5 + 3^5 = 3\,(3^5)$

$= 3^{(5+1)}$

$= 3^6$

Hence the answer is 3^6.

Question 14 :

Suma averaged 84 on her first three exams and 82 on her next 2 exams. What grade must she obtain on her sixth test in order to average 85 for all six exams.

(A) 96 (B) 94 (C) 90 (D) 89 (E) 86

Solution :

By writing the marks scored in six exams

Let "x" be the required mark in sixth subject.

84, 84, 84, 82, 82, x

Average mark = 85

[3(84) + 2(82) + x]/6 = 85

252 + 164 + x = 85(6)

416 + x = 510

x = 510 - 416

x = 94

Hence she has to score 94 mark in 6th exam.

Question 15:

How many multiples of 3 between 1 and 22 are even?

(A) 7 (B) 5 (C) 3 (D) 1 (E) None

Solution :

Multiples of 3 lies between 1 and 22.

3, 6 9, 12, 15, 18, 21

Hence there 7 numbers lies between 1 and 22.

Question 16:

At 9 A.M. it was 12 degrees below zero. By noon the temperature had dropped 7 degrees. Over the next two hours, the temperature rose 5 degrees. What was the temperature at 2 P.M.?

(A) 0° (B) 10° below zero (C) 14° below zero

(D) 24° below zero (E) none of these

Solution :

At 9 A.M the temperature was 12 degrees below zero.

At 12 P.M, the temperature has dropped 7 degree

So, the temperature was = -12 - 7 = -19

After two hours from 12 P.M, the temperature rose 5 degrees

At 2 PM, the new temperature will be = -19 + 5

= -14 degree

Hence 14° below zero is the required answer.

Question 17 :

Babu's age is now 3 times Ramu's age. Twelve years from now, Ramu will be 15 years old. How many years old is Babu now?

(A) 3 (B) 5 (C) 9 (D) 27 (E) 45

Solution :

Let "x" be Ramu's age.

After 12 years, Ramu's age will be 15.

$x + 12 = 15$

$x = 15-12 = 3$

Ramu's present age = 3

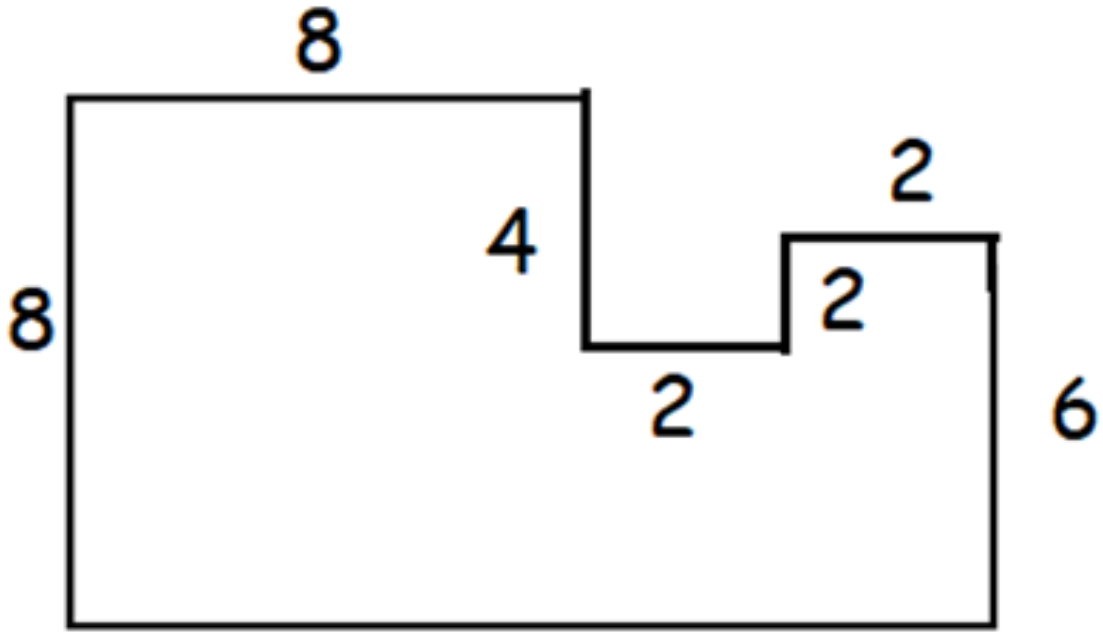
Babu's present age = 3 times Ramu's present age

= 3 (3)

= 9

Hence, the required age is 9 years.

Question 18: In the figure, all line segments meet at right angles. What is the area enclosed by the figure?



- (A) 84 (B) 72 (C) 70 (D) 68 (E) 64

Solution

Solution

From the picture given above, length of the rectangle is 12 and width of the rectangle is 8.

Area of the rectangle = length · Width

= 12 (8)

= 96

Required area

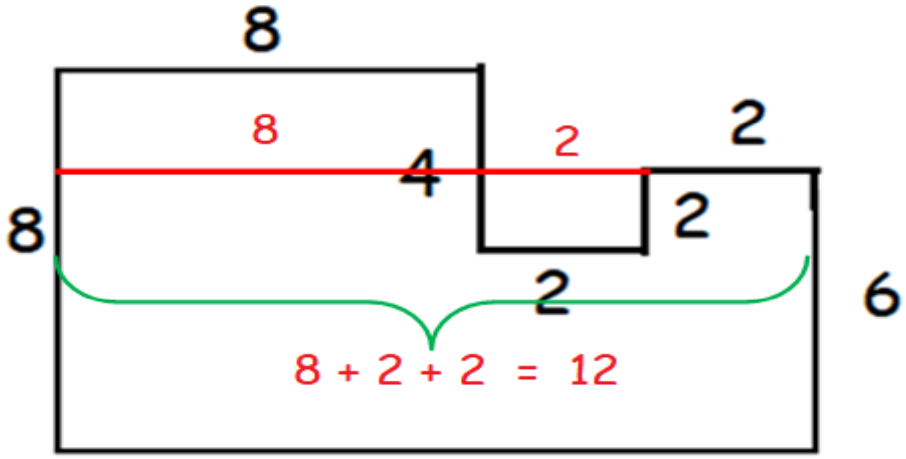
= 96 - (area of square of side length 2 + area of rectangle with length and width are 4 and 2 respectively)

= $96 - [2^2 + 4(2)]$

= 96 - [4 + 8]

= 96 - 12

= 84



CLOCK PROBLEMS

Points to Remember

1. The face of a clock would be a circle whose circumference is divided in to 60 equal parts called minute spaces
2. Every clock would have two hands. The smaller one is called short hand or hour hand and the larger one is called long hand or minute hand.
3. The face of a clock would be a circle whose circumference is divided in to 60 equal parts called minute spaces
4. In every hour, both the hands coincide once.
5. If the hands are in the same straight line, either they are coincident or they are opposite to each other.
6. If there is 15 minute space between the hour hand and minute hand, then they are at right angle.
7. If there is 30 minute space between the hour hand and minute hand, then they are in opposite directions.

8. Angle traced by hour hand in 12 hours is 360°.

9. Angle traced by hour hand in 1 hour is

= 360° / 12

= 30°

10. Angle traced by minute hand in 60 minutes is 360°

11. Angle traced by minute hand in 1 minute is

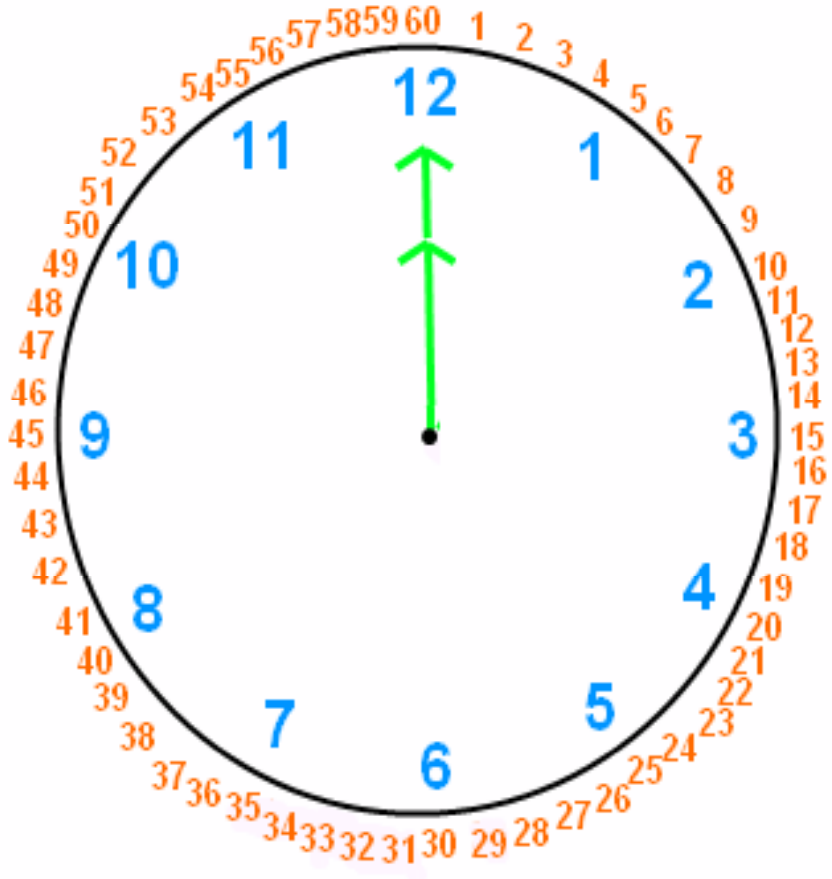
= 360° / 60

= 6°

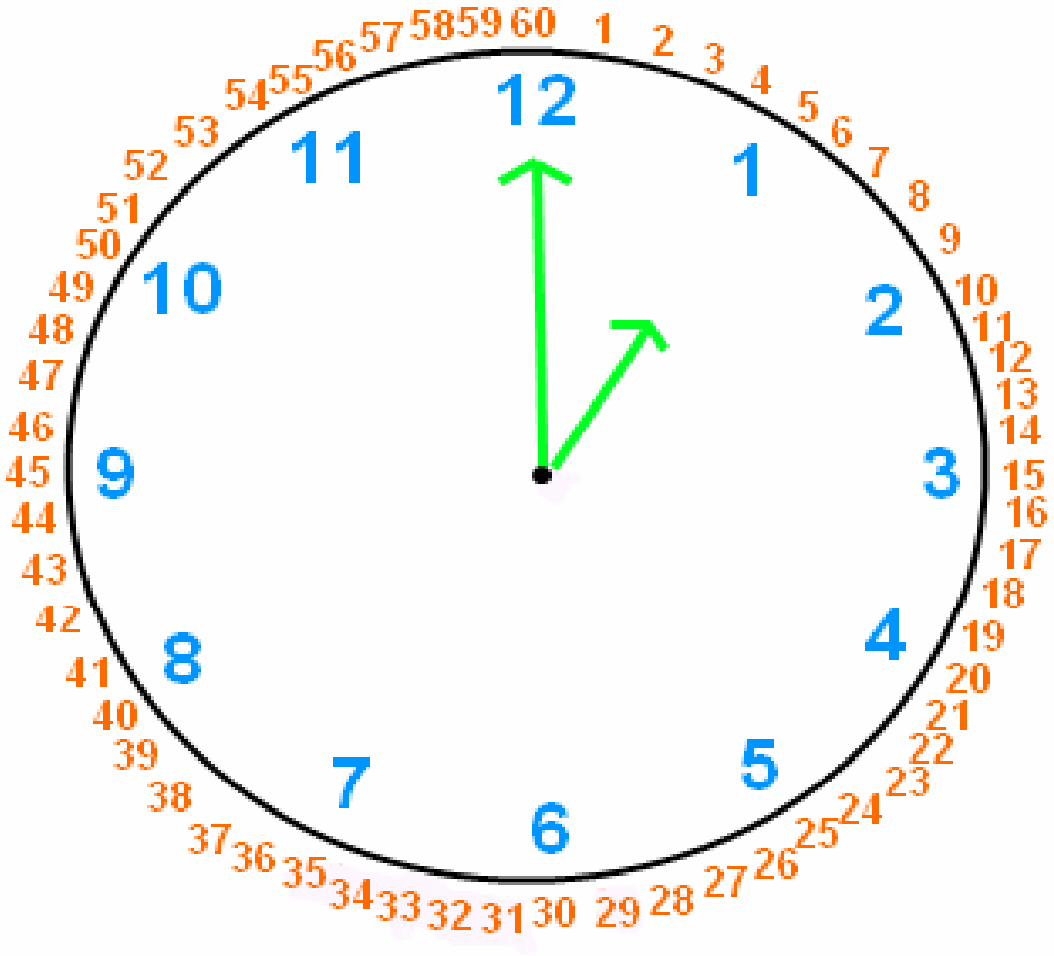
12. Angle between the hour hand and minute hand is

= Difference between the angles traced by hour hand and minute hand.

In the above clock, the two hands are coincident and the time is 12'o clock. The minute spaces between the two hands is zero.



If the minute hand traces 60 minutes, the time will be 1'o clock. That has been shown in the clock below



Problem 18 : How many times do the hands of a clock coincide in a day ?

Solution :

The hands of a clock coincide in the following timings.

12'o clock ---> 1

1 to 2 ----> 2

2 to 3 ----> 3

3 to 4 ----> 4

4 to 5 ----> 5

5 to 6 ----> 6

6 to 7 ----> 7

7 to 8 ----> 8

8 to 9 ----> 9

9 to 10 ----> 10

10 to 11 ----> 11

From the above calculation, it is very clear that the hands coincide 11 times in 12 hours.

In 24 hours, they coincide 22 times.

So, the hands of a clock coincide 22 times in a day.

Problem 19 : How many times in a day, are the hands of a clock in straight line but opposite in direction ?

Solution :

The hands of a clock point in opposite direction in the following timings.

6'o clock ---> 1

7 to 8 ----> 2

8 to 9 ----> 3

9 to 10 ----> 4

10 to 11 ----> 5

11 to 12 ----> 6

12 to 1 ----> 7

1 to 2 ----> 8

2 to 3 ----> 9

3 to 4 ----> 10

4 to 5 ----> 11

From the above calculation, it is very clear that the hands point in opposite directions 11 times in 12 hours.

In 24 hours, they point in opposite directions in 22 times.

So, they point in opposite directions 22 times in a day.

Problem 20 : How many times are the hands of a clock at right angle in a day ?

Solution :

Number of times of right angle between the two hands in the following timings.

12 to 1 ----> 2 times

1 to 2 ----> 2 times

2 to 3 ----> 2 times (right angle at 3'o clock included)

3 to 4 ----> 1 time (right angle at 3'o clock not included)

4 to 5 ----> 2 times

5 to 6 ----> 2 times

6 to 7 ----> 2 times

7 to 8 ----> 2 times

8 to 9 ----> 2 times (right angle at 9'o clock included)

9 to 10 ----> 1 time (right angle at 9'o clock not included)

10 to 11 ----> 2 times

11 to 12 ----> 2 times

From the above calculation, it is clear that the hands are at right angle 22 times in 12 hours.

In 24 hours, the hands are at right angle in 44 times

So, the hands of a clock at right angle 44 times in a day.

Problem 21 :

- Look at this series: 3, 6, 9, 12, 15,
- What number should come next?
- a. 16
- b. 18
- c. 19
- d.21

- This is a simple addition series. Each number increases by 3.

Problem 22 :

- Look at this series:
- 66, 59, 52, 45, 38,
- What number should come next?
- a.31
- b.32
- c.35
- d.41
- a. This is a simple subtraction series; each number is 7 less than the previous number.

- Look at this series: 44, 44, 50, 50, 56 What number should come next?
- a.44
- b.48
- c.56
- d.62

- c. This is an alternation with repetition series in which each number repeats itself, and then increases by 6.

- Look at this series: 102, 103, 105, 108, What number should come next?
- a. 106
- b. 109
- c. 111
- d. 112

- d. In this addition series, 1 is added to the first number; 2 is added to the second number; 3 is added to the third number; and so forth.

- Look at this series: 567, 542, 517, 492, What number should come next?
- a.467
- b. 477
- c. 483
- d.499
- a. This is a simple subtraction series; each number is 25 less than the previous number.

- Look at this series: 50, 5, 40, 10, 30, What number should come next?
- a. 15
- b. 20
- c. 25
- d. 35
- a. This is an alternating addition and subtraction series. In the first pattern, 10 is subtracted from each number to arrive at the next. In the second, 5 is added to
- each number to arrive at the next.

- Look at this series: 9, 24, 9, 30, 9, What number should come next?
- a. 10
- b. 16
- c. 31
- d.36
- d. This is a simple addition series with a random number, 9, interpolated as every other number. In the series, 6 is added to each number except 9, to arrive at the
- next number.

Analogy

Analogy =opposite

- Which word does NOT belong with the others?
- a. core
- b. seeds
- c. pulp
- d. slice

- d. The core, the seeds, and the pulp are all parts of an apple. A slice would be a piece taken out of an apple.

- Which word does NOT belong with the others?
- a. festive
- b. lucky
- c. joyjous
- d. merry

- b. Festive, joyous, and merry are all synonyms. Lucky has a different meaning.

- Which word does NOT belong with the others?
- a. geology
- b. zoology
- c. theology
- d. botany

- c. Geology, zoology, and botany are all branches of science. Theology is the study of religion.

- Which word does NOT belong with the others?
- a. sphere
- b. parallelogram
- c. square
- d. rectangle

- a. The parallelogram, the square, and the rectangle all have four sides. The sphere is a different shape and has no angles.

- Which word does NOT belong with the others?
- a. baffle
- b. falter
- c. hesitate
- d. waver

- a. Falter, hesitate, and waver are all synonyms; baffle does not mean the same thing.

- Which word does NOT belong with the others?
- a. instruct
- b. teach
- c. educate
- d. discipline

- d. Instruct, teach, and educate are all synonyms.

- Which word does NOT belong with the others?
- a. lobster
- b. trout
- c. sardine
- b. catfish
- a. The trout, sardine, and catfish are all types of fish; the lobster is a crustacean.

- Which word does NOT belong with the others?
- a. scythe
- b. knife
- c. pliers
- d. saw
- c. The scythe, the knife, and the saw are all cutting tools. Pliers are tools but they are not used for cutting.

- Which word does NOT belong with the others?
- a. two
- b. three
- c. six
- d. eight
- b. Two, six, and eight are all even numbers; three is an odd number.

- Which word does NOT belong with the others?
- a. peninsula
- b. island
- c. bay
- d. cape
- c. A peninsula, an island, and a cape are all landforms; a bay is a body of water.

- Which word does NOT belong with the others?
- a. seat
- b. rung
- c. cushion
- d. leg
- c. Seat, rung, and leg are all parts of a chair. Not all chairs have cushions.

- Which word does NOT belong with the others?
- a. fair
- b. just
- c. equitable
- d. favourable
- d. Fair, just, and equitable are all synonyms meaning impartial. Favourable means expressing approval.

- Which word does NOT belong with the others?
- a. defendant
- b. prosecutor
- c. trail
- d. judge
- c. Defendant, prosecutor, and judge are all persons involved in a trial. A trial is not a person.

- Which word does NOT belong with the others?
- a. area
- b. variable
- c. circumference
- d. quadrilateral
- b. Area, circumference, and quadrilateral are all terms used in the study of geometry. Variable is a term generally used in the study of algebra.

- Which word NOT belong with the others?
- a. mayor
- b. lawyer
- c. governor
- d. senator
- b. The mayor, governor, and senator are all persons elected to government offices; the lawyer is not an elected official.

- Which word does NOT belong with the others?
- a. acute
- b. right
- c. obtuse
- d. parallel
- d. Acute, right, and obtuse are geometric terms describing particular angles. Parallel refers to two lines that never intersect.

- Which word does NOT belongs with the others?
- a. wing
- b. fin
- c. beak
- d. rudder
- c. The wing, fin, and rudder are all parts of an airplane.

- Which word does NOT belong with the others?
- a. aorta
- b. heart
- c. liver
- d. stomach
- a. The heart, liver, and stomach are all organs of the body. The aorta is an artery, not an organ.

- Cup is to coffee as bowl is to
- a. dish
- b. soup
- c. spoon
- d. food
- b. Coffee goes into a cup and soup goes into a bowl. Choices a and c are incorrect because they are other utensils. The answer is not choice d because the
- Word food is too general.

- Communication is to telephone as transportation is to
- a. aviation
- b. travel
- c. information
- d. bus

- d. The telephone is a means of communication. The bus is a means of transportation. Aviation (choice a) is not the answer because it is a type of transportation, not a means. The answer is not choice b or choice c because neither of these represents a means of transportation.

- Bicycle is to pedal as canoe is to
- a. water
- b. kayak
- c. oar
- d. fleet
- c. A bicycle is put in motion by means of a pedal. A canoe is put into motion by means of an oar. The answer is not choice a because the substance water does not necessarily put the canoe into motion. Kayak (choice b) is incorrect because it is a type of boat similar to a canoe. Choice d is incorrect because a fleet is a group of boats.

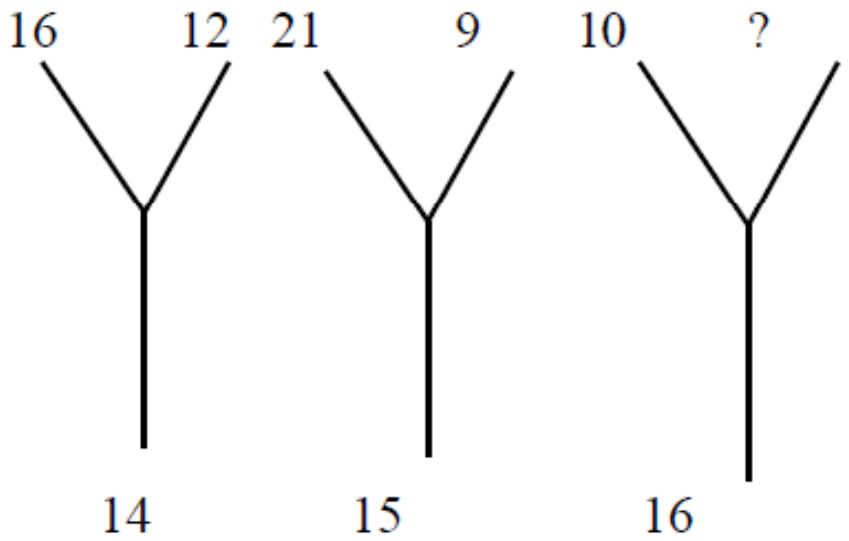
- Window is to pane as book is to
- a. novel
- b. glass
- c. cover
- d. page
- d. A window is made up of panes, and a book is made up of pages. The answer is not choice a, because a novel is a type of book. The answer is not choice b, because glass has no relationship to a book. Choice c is incorrect because a cover is only one part of a book; a book is not made up of covers.

- Play is to actor as concert is to
- a. symphony
- b. musician
- c. piano
- d. percussion
- b. An actor performs in a play. A musician performs at a concert. Choices a, c, and d are incorrect because none are people who perform.

Numerical Ability exercises

DIRECTIONS: In the following questions find missing number.

1.



(a) -21 (b) 12

(c) 32 (d) 22

- d

DIRECTIONS: In the following questions find missing number.

2.

1	2	3	2	10	12
2	5	12	10	16	13
1	2	1	?	10	24

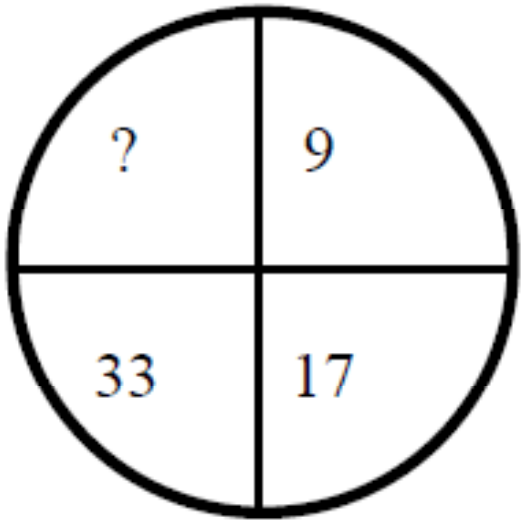
(a) 5 (b) 11

(c) 13 (d) 8

C

DIRECTIONS: In the following questions find missing number.

3.



(a) 60 (b) 68

(c) 55 (d) 65

d

DIRECTIONS: In the following questions find missing number.

5.

169	64	81	30
625	?	49	50
1296	576	100	70

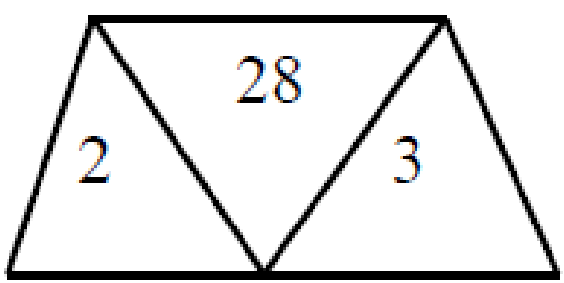
(a) 324 (b) 289

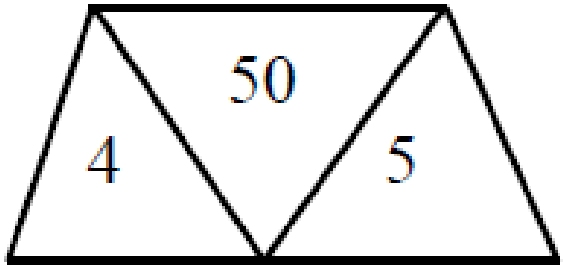
(c) 441 (d) 361

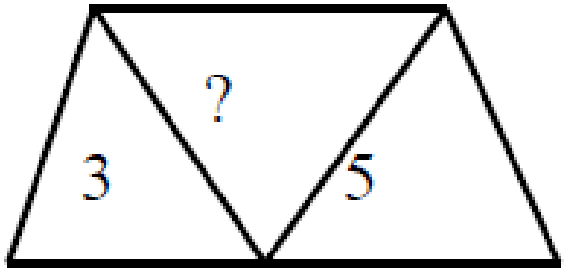
a

DIRECTIONS: In the following questions find missing number.

10.





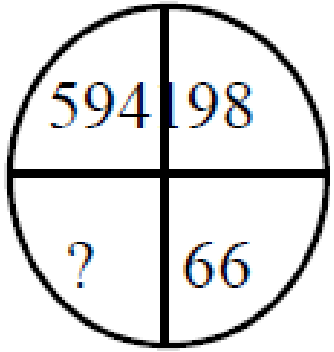


(a) 35
(b) 40
(c) 49
(d) 53

b

DIRECTIONS: In the following questions find missing number.

19.

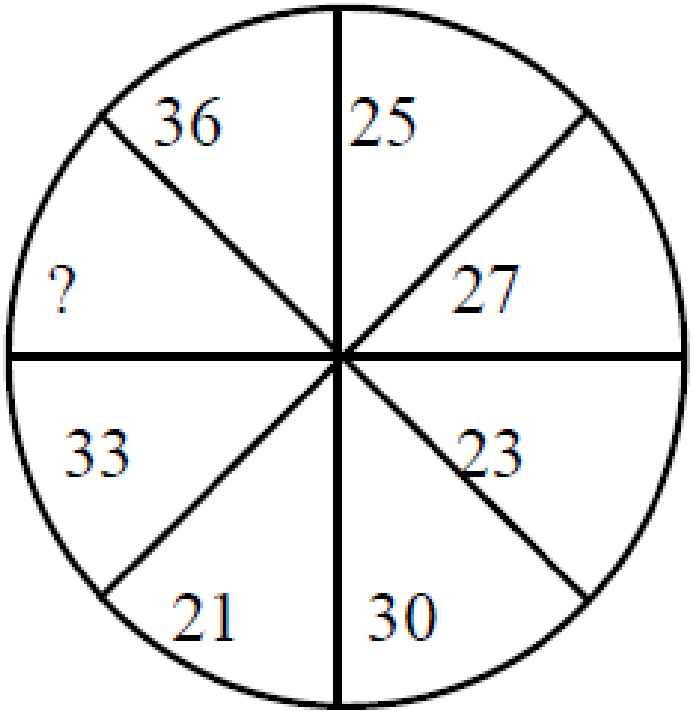


(a) 22
(b) 33
(c) 11
(d) 44

a

DIRECTIONS: In the following questions find missing number.

21.



(a) 35
(b) 32
(c) 22
(d) 19

b

Programme Continues….