

personal detail

Programming and Mathematics Ability [20 Questions].

In this exercise, you will be presented with some **timed** questions. The aim is to gauge your ability to solve everyday mathematics and programming problems.

Note:

1. Time management is crucial.
2. Skip any question that seems difficult. Preferably, make attempt and you can return to it (if time permits)
3. To conserve time, try to finish each question before the allocated time and hit the "**Next**" button

Name (In this order --> *surname* *firstname*)

Class

Student ID Number (e.g., *BatchA-88, BatchB-78 etc*)

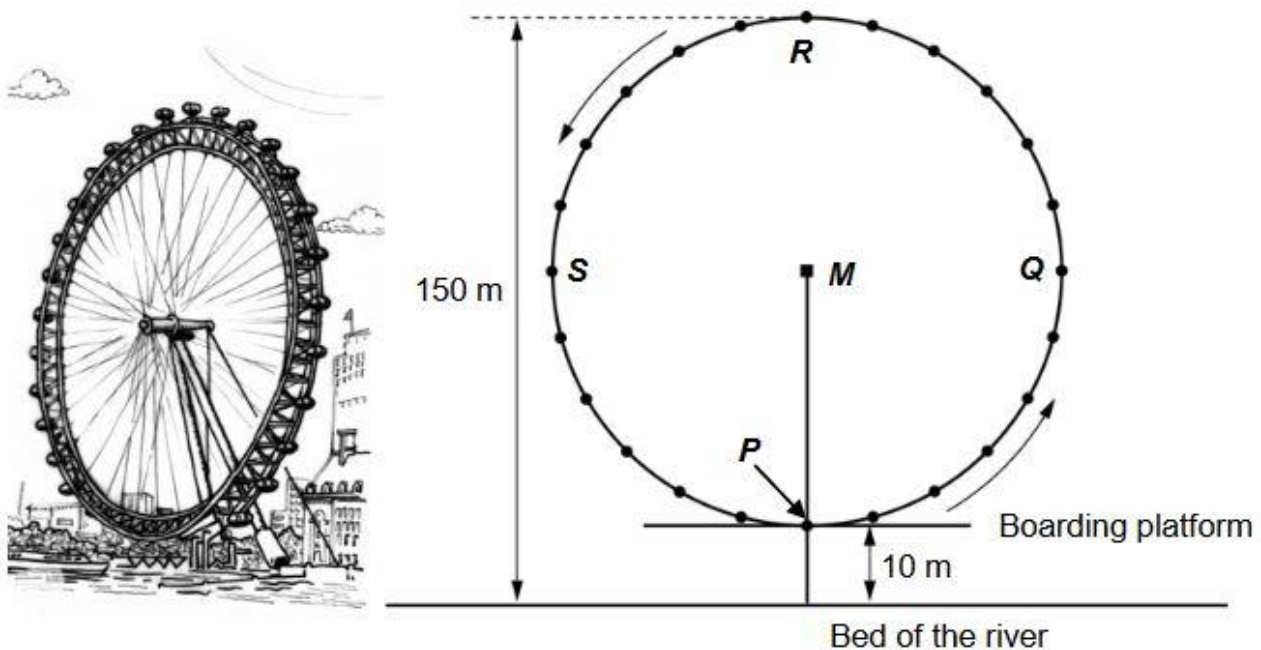
example

You have 0 minutes remaining to answer all questions

Q1 of 20 [Max time allocated for this question is 3 minutes]

FERRIS WHEEL

A giant Ferris wheel is on the bank of a river. See the picture and diagram below.



The Ferris wheel has an external diameter of 140 metres and its highest point is 150 metres above the bed of the river. It rotates in the direction shown by the arrows.

The letter M in the diagram indicates the centre of the wheel.

How many metres (m) above the bed of the river is point M?

0300

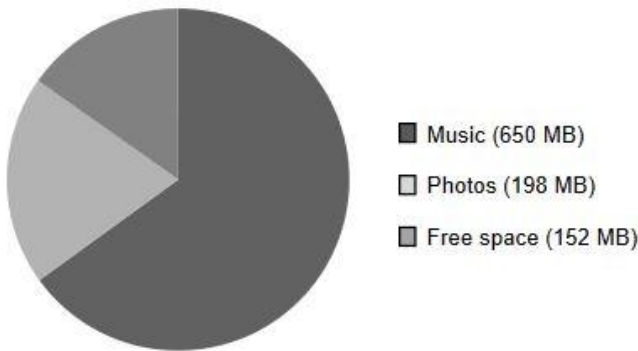
math 1

You have 0 minutes remaining to answer all questions

Q1 of 20 [Max time allocated for this question is 3 minutes]

Emeka's Flash Drive

Emeka has a flash drive for storing music and photos. The capacity of the flash drive is 1GB (1000MB). The chart below shows the current disk status



Emeka wants to transfers a photo of 350MB to his flash drive, but there is not enough free space. He does not want to delete existing photos. However, he is willing to delete at most 2 music albums as shown below.

Album	Size
Album 1	100 MB
Album 2	75 MB
Album 3	80 MB
Album 4	55 MB
Album 5	60 MB
Album 6	80 MB
Album 7	75 MB
Album 8	125 MB

Question

Is it possible for Emeka to have enough space for the photo by deleting 2 music albums? Please explain or show your calculation.

0300

math 2

You have 0 minutes remaining to answer all questions

Q2 of 20 [Max time allocated for this question is 3 minutes]

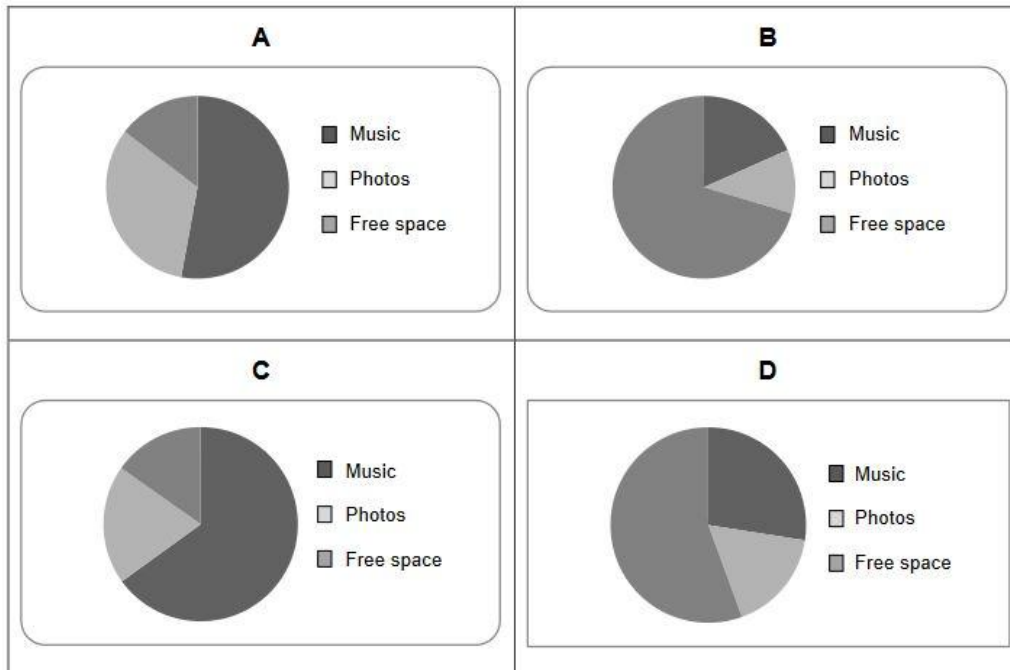
Emeka's Flash Drive

Emeka has a flash drive for storing music and photos. The capacity of the flash drive is 1GB (1000MB). The chart below shows the new disk status after 2 weeks

Music	550 MB
Photos	338 MB
Free space	112 MB

On Emeka's birthday, he received a new and empty flash drive from his uncle with capacity of 2GB (2000MB). Emeka transferred the content of his old flash drive to the new one.

Which of the following graphs represents the new flash drive memory status?



- A
- B
- C
- D

0300

block 1B

You have **0** minutes remaining to answer all questions

Q3 of 20 [Max time allocated for this question is **3 minutes**]

This program computes the simple interest for customers' bank deposit and display the customer's **name, deposit and interest.**

```
name = "Paul Chan"
deposit = 200
rate = 1
time = 2
interest = deposit * rate * time

print('Your interest on',deposit, ' = ', interest)
```

When the program is executed, what will be displayed on the screen? Select the correct option

Your interest on, deposit, = , interest

Your interest on deposit = 400

Your interest on 200 = 400

'Your interest on' 200 ' = ' 400

0300

block 1A

You have 0 minutes remaining to answer all questions

Q4 of 20 [Max time allocated for this question is 3 minutes]

This program computes the **interest** on a deposit and displays the **name, deposit** and **interest**. (Hint: There is no syntax error)

```
name = "Paul Chan"
deposit = 200
rate = 1
time = 2
interest = deposit * rate * time

print('Your interest on',deposit, ' = ', interest)
```

When the program is executed, what will be displayed on the screen? Enter your answer in the **text box below**

0300

block 1C

You have **0** minutes remaining to answer all questions

Q5 of 20 [Max time allocated for this question is **5 minutes**]

Write a program that **computes** and **displays** the average **age** of 3 students. In designing your program, consider appropriate use of variables because the age of the students is not constant and the program will be used for other students

Sample result: When the program is executed, a sample output (when the ages are 19, 20, 21) should be

The average age of the students is 20

0500

math 3

You have 0 minutes remaining to answer all questions

Q6 of 20 [Max time allocated for this question is 3 minutes]

The *Electrix Company* makes two types of electronic equipment: video and audio players. At the end of the daily production, the players are tested and those with faults are removed and sent for repair.

The following table shows the average number of players of each type that are made per day, and the average percentage of faulty players per day.

Player type	Average number of players made per day	Average percentage of faulty players per day
Video players	2000	5%
Audio players	6000	3%

Below are three statements about the daily production at *Electrix Company*. Are the statements correct?

	Yes	No
One third of the players produced daily are video players	<input type="radio"/>	<input type="radio"/>
In each batch of 100 video players made, exactly 5 will be faulty.	<input type="radio"/>	<input type="radio"/>
If an audio player is chosen at random from the daily production for testing, the probability that it will need to be repaired is 0.03	<input type="radio"/>	<input type="radio"/>

0300

math 4

You have 0 minutes remaining to answer all questions

Q7 of 20 [Max time allocated for this question is 3 minutes]

The *Electrix Company* makes two types of electronic equipment: video and audio players. At the end of the daily production, the players are tested and those with faults are removed and sent for repair.

The following table shows the average number of players of each type that are made per day, and the average percentage of faulty players per day.

Player type	Average number of players made per day	Average percentage of faulty players per day
Video players	2000	5%
Audio players	6000	3%

One of the testers makes the following claim:

"On average, there are more video players sent for repair per day compared to the number of audio players sent for repair per day."

Decide whether or not the tester's claim is correct. Give a mathematical argument to support your answer

0300

block 2B

You have 0 minutes remaining to answer all questions

Q8 of 20 [Max time allocated for this question is 3 minutes]

This program computes the average of a student's score in 3 subjects and displays the **grade**

```
math = 70
english = 80
stem = 60

total = math + stem + english
average = total / 3

if average >= 80:
    print ("Grade A")
elif average >= 65:
    print("Grade B")
elif average >= 50:
    print("Grade C")
else:
    print("Grade F")
```

When the program is executed, what will be displayed on the screen? Select the correct option

Grade A

"Grade A"

Grade B

"Grade B"

0300

block 2A

You have **0** minutes remaining to answer all questions

Q9 of 20 [Max time allocated for this question is **3 minutes**]

This program computes the average of a student's score in 3 subjects and displays the **grade** (Hint: There is no syntax error)

```
math = 70
english = 80
stem = 60

total = math + stem + english
average = total / 3

if average >= 80:
    print ("Grade A")
elif average >= 65:
    print("Grade B")
elif average >= 50:
    print("Grade C")
else:
    print("Grade F")
```

When the program is executed, what will be displayed on the screen? Enter your answer in the **text box below**

block 2C

You have **0** minutes remaining to answer all questions

Q10 of 20 [Max time allocated for this question is **5 minutes**]

Write a program that **computes** the average score of 3 subjects and **displays** the grade.

The school grading system states that if average score is:

90 - 100 = Grade A

70 - 89 = Grade B

60 - 69 = Grade C

50 - 59 = Grade D

0 - 49 = Grade F

Sample result: When the program is executed, a sample output (if the subject scores are 60, 65, 70) should be
Grade C



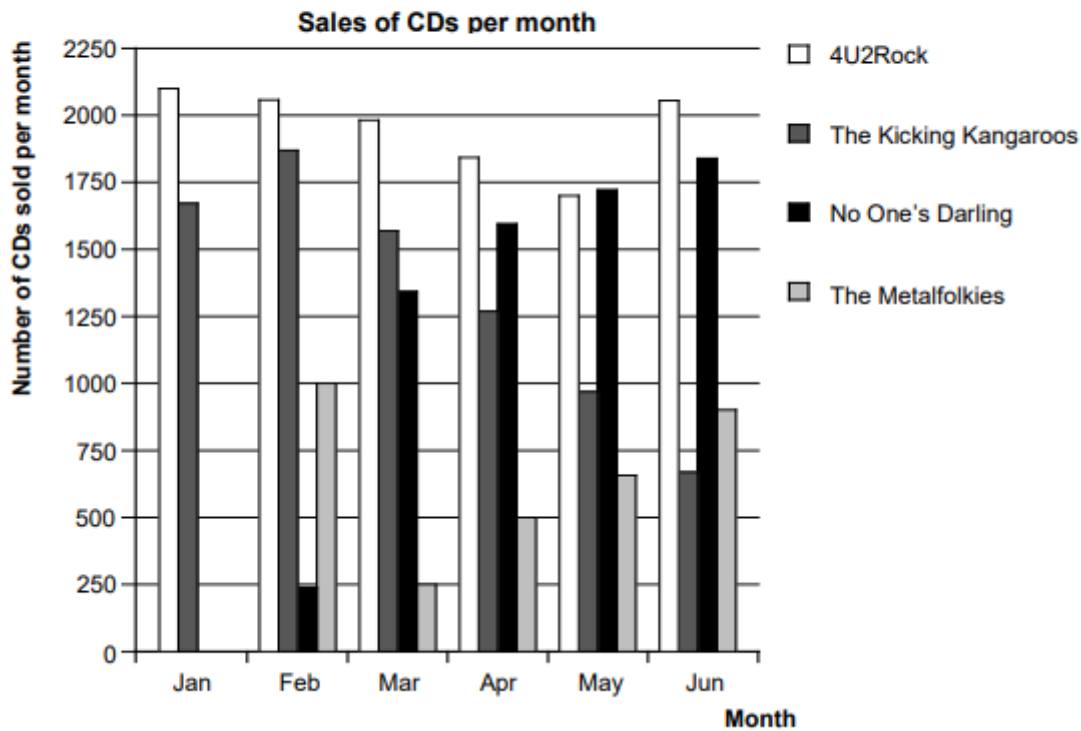
0500

math 5

You have **0** minutes remaining to answer all questions

Q11 of 20 [Max time allocated for this question is **3 minutes**]

In January, the new CDs of the bands *4U2Rock* and *The Kicking Kangaroos* were released. In February, the CDs of the bands *No One's Darling* and *The Metalfolkies* followed. The following graph shows the sales of the bands' CDs from January to June.



How many CDs did ***The Metalfolkies*** sell in April?

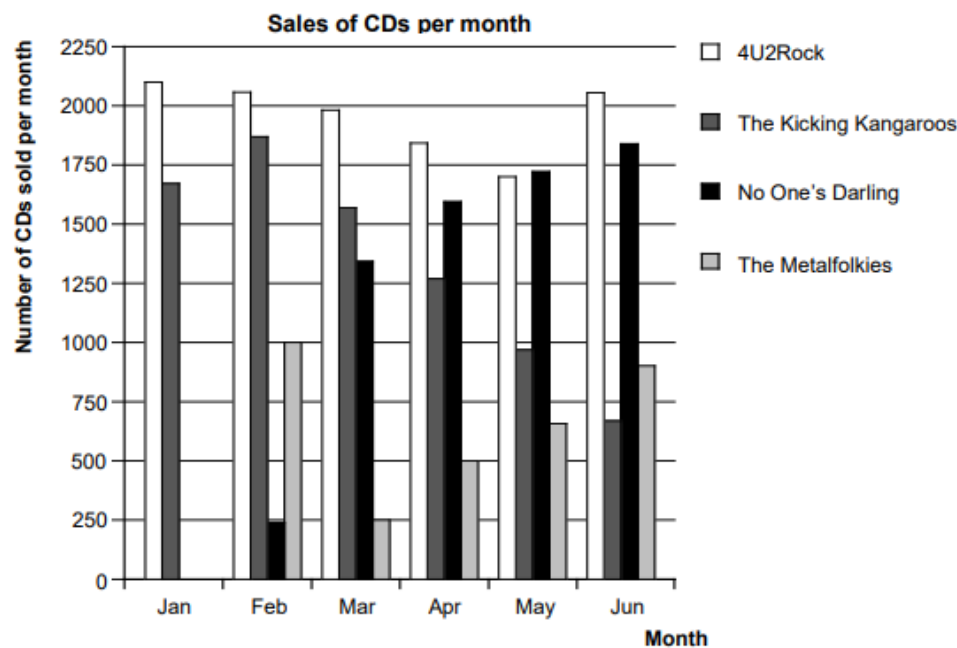
0300

math 6

You have 0 minutes remaining to answer all questions

Q12 of 20 [Max time allocated for this question is 3 minutes]

In January, the new CDs of the bands *4U2Rock* and *The Kicking Kangaroos* were released. In February, the CDs of the bands *No One's Darling* and *The Metalfolkies* followed. The following graph shows the sales of the bands' CDs from January to June.



In which month did *No One's Darling* sell more CDs than *The Kicking Kangaroos*?

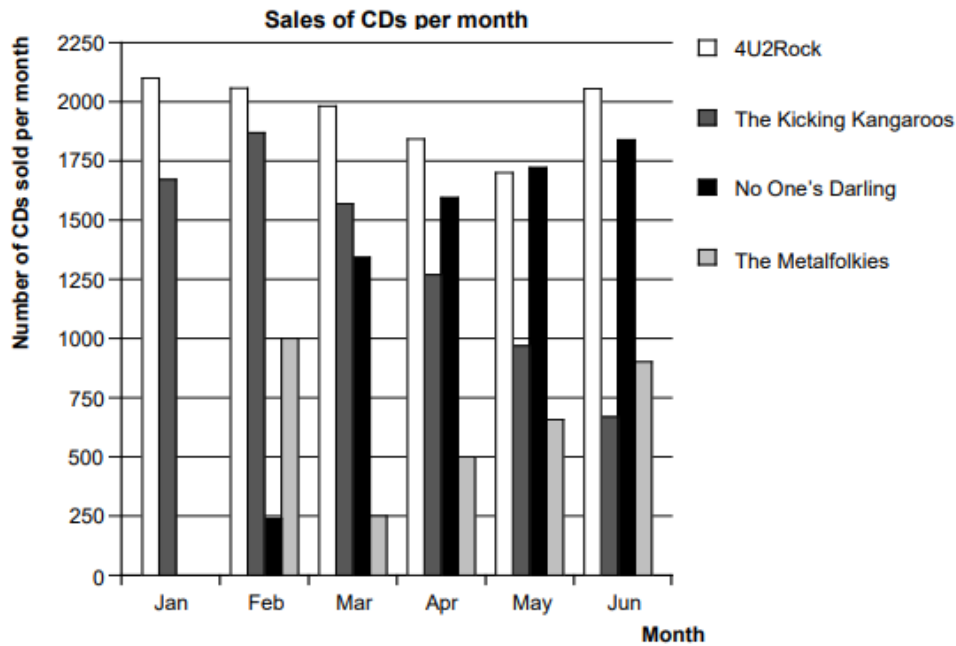
0300

math 7

You have 0 minutes remaining to answer all questions

Q13 of 20 [Max time allocated for this question is 3 minutes]

In January, the new CDs of the bands *4U2Rock* and *The Kicking Kangaroos* were released. In February, the CDs of the bands *No One's Darling* and *The Metalfolkies* followed. The following graph shows the sales of the bands' CDs from January to June.



The manager of *The Kicking Kangaroos* is worried because the number of their CDs that sold decreased from February to June.

What is the estimate of their sales volume for July if the negative trend continues?

70 CDs

370 CDs

670 CDs

1340 CDs

0300

block 3B

You have 0 minutes remaining to answer all questions

Q14 of 20 [Max time allocated for this question is 3 minutes]

The purpose of this program is unknown. However, we guessed that the program was designed to find the prime numbers **or**

factors **or** multiples of the inputted number

```
num = int(input('please enter a number: '))

for i in range(1, num + 1):
    if num % i == 0:
        print(i)
```

When the program is executed, what will be displayed on the screen if **30** was entered as the input? Select the correct option

1, 2, 3, 5

1, 2, 3, 5, 10, 15

2, 3, 5

1, 2, 3, 5, 6, 10, 15, 30

0 3 0 0

block 3A

You have **0** minutes remaining to answer all questions

Q15 of 20 [Max time allocated for this question is **3 minutes**]

The program below was design for specific (but unknown) purpose.

(Hint: There is no syntax error)

```
num = int(input('please enter a number: '))

for i in range(1, num + 1):
    if num % i == 0:
        print(i)
```


When the program is executed, what will be displayed on the screen if **10** was entered as the input? Enter your answer in the **text box below**

0300

block 3C

You have **0** minutes remaining to answer all questions

Q16 of 20 [Max time allocated for this question is **5 minutes**]

Write a program that **computes** and **displays** the factors of a given number

Sample result: When the program is executed, a sample output (when 15 is the given number) should be **1, 3, 5, 15**

0500

block 3AA

You have 0 minutes remaining to answer all questions

Q17 of 20 [Max time allocated for this question is 3 minutes]

Briefly describe the purpose of program snippet below (i.e., what did the programmer intend to achieve through the codes)

```
num = int(input('please enter a number: '))  
  
for i in range(1, num + 1):  
    if num % i == 0:  
        print(i)
```

Enter your answer in the **text box below**

0300

math 8

You have 0 minutes remaining to answer all questions

Q18 of 20 [Max time allocated for this question is 3 minutes]

PENGUINS



The animal photographer Jean Baptiste went on a year-long expedition and took numerous photos of penguins and their chicks.

He was particularly interested in the growth in the size of different penguin colonies.

Normally, a penguin couple produces two eggs every year. Usually the chick from the larger of the two eggs is the only one that survives.

With rockhopper penguins, the first egg weighs approximately 78 g and the second egg weighs approximately 110 g.

By approximately how many percent is the second egg heavier than the first egg?

29%

32%

41%

71%

0300

math 9

You have 0 minutes remaining to answer all questions

Q19 of 20 [Max time allocated for this question is 3 minutes]

PENGUINS



The animal photographer Jean Baptiste went on a year-long expedition and took numerous photos of penguins and their chicks.

He was particularly interested in the growth in the size of different penguin colonies.

Jean wonders how the size of a penguin colony will change over the next few years. In order to determine this, he makes the following assumptions:

- At the beginning of the year, the colony consists of 10 000 penguins (5 000 couples).
- Each penguin couple raises one chick in the spring of each year.
- By the end of the year, 20% of all the penguins (adults and chicks) will die.

At the end of the first year, how many penguins (adults and chicks) are there in the colony?

0300

math 10

You have 0 minutes remaining to answer all questions

Q20 of 20 [Max time allocated for this question is 3 minutes]

You are making your own dressing for a salad.

Here is a recipe for 100 millilitres (mL) of dressing.

Salad oil:	60 mL
Vinegar:	30 mL
Soy sauce:	10 mL

How many millilitres (mL) of salad oil do you need to make 150 mL of this dressing?

0300

submit

You have **0** minutes remaining to answer all questions

Warning: This is the last page of the test.

click SUBMIT (to end the Test) **or Back** (to continue with the test)

Do you wish to submit Test now?

Yes

No

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