## Grade 7 Question 1

Brian, Chris, and Stewie are lining up to ride the BarfCoaster at PeterLand.


In how many ways can they line up?

## Grade 7 Question 2

## Inspector

Gadget is trying to open a safe.
The safe will open when a certain 3
numbers are entered in increasing

order. One clue is that the numbers are all even. The second clue is that the 3 numbers have a product which is the missing number in this sequence: $0,3,8,15,24,35$,__, 63, 80, 89

What is the code that opens the safe?

## Grade 7 Question3

It takes 40 days for a pond to be covered with lily pads in the spring. On day 1 , there is 1 lily pad. The number of lily pads doubles each day.


On which day will the pond be half-covered?

## Grade 7 Question 4

There are 1100 fans at a university hockey game between Dal and S $\dagger$ F.X, hosted by Dal.

There are 700 people from Halifax in attendance. There are 400 people cheering for St. F.X., and 100 of those are from Halifax.

How many are neither from Halifax, nor cheering for St.F.X.?

## Grade 7 Question 5

This summer, the rock band Bon Jovi will play at the Metro Center in Halifax. The tickets have already been sold. The tickets cost $\$ 200$ for lower deck seats and $\$ 100$ for upper deck seats. The number of tickets sold is the same for each deck, and the total ticket revenue was \$600 000.


How many tickets were sold in total?

## Grade 8 Question 1

Johnny scored 24 out of 60 on his first Math test, 21 out of 30 on his second test, and 85 out of 100 on his third. All of the tests are worth the same.


What was his average on the 3 tests?

## Grade 8 Question2

At her birthday party, Sara had a large double chocolate ice cream cake. Sara and her friends ate fiveninths of the cake. Later that evening, Sara's dad
 ate half of what was remaining.

How much is left for Sara the next day?

## Grade 8 Question 3

It takes 12 workers, 15 days to
construct a new garage. Three of the workers on the crew leave for a vacation during the whole job, and are not replaced.

How many EXTRA days will it take now to complete?

## Grade 8 Question 4

Doug has a daughter, Christine. Presently, Doug is 5 years more than 3 times Christine's age. The sum of their ages is 45 .


What are their ages?

## Grade 8 Question 5

Alia gets a new job. She makes $\$ 1$ the first day, with the agreement that she makes double that amount the $2^{\text {nd }}$ day. On the 3rd day, her wage doubles again, and so on. Jimbo also gets a new job that starts on the same day. He gets paid $\$ 50$ each day.


After how many days will Alia's total wages pass Jimbo's total wages?

## Grade 9 Question 1

The difference of the squares of two consecutive numbers is 21.


What are the numbers?

## Grade 9 Question 2

The sum of the second and seventh numbers in a list of consecutive even numbers is 114 .

What is the sum of the first 3 numbers?

## Grade 9 Question3

Today, Jeremy is 2 years away from being twice as old as his sister Jennifer.
The sum of Jeremy's age and 3 times
Jennifer's age is 93.


What are their ages now?

## Grade 9 Question 4

A binary number is made up of only zeros and ones.
(Hint: A 3-digit binary number can start with a zero)


How many different 3-digit binary numbers can be written?

## Grade 9 Question 5

A rectangular flag that measures 24 units by 7 units is designed with a pattern made up of 3 regions. One region is a red
triangle that shares a right angle with one corner of the flag. It measures 12 units by 5 units. Another region is a blue triangle that shares a right angle with the opposite corner of the flag than the red triangle. It measures 24 units by 7 units. The region in between the two triangles is white with a gold border.

How long is this border?

## Challenge Question 1

For every 3 boys in Science class, there are 4 girls.Each class has 28 students and one teacher. There are 9 Science classes in the school.


How many boys are there?

## Challenge Question 2

Arlene has 3 times as many comic books as Gloria, who has half as many as Marlene. Marlene has 7 more than Joey, who has one fifth as many as Arlene.


How many do they have all together?

## Challenge Question 3

A square has 2 diagonals that intersect, making 4 right angles. The diagonals are each 10 cm long.


What is the area of the square?

## Challenge Question 4

A pineapple ring measures 10 cm across, with a hole that measures 4 cm across.
The pineapple ring is lying flat on the table on Jimmy's Math homework.
It leaves a stain on the paper so that the ring could easily be traced. The stain has an area of
$A B \mathrm{~cm}^{2}$.


What number is $A$ ?

## Challenge Question 5 (\#6)

Jody Shelley of the New York Rangers is not known for his ability to score goals. He is more widely known for his physical style of play. In one season, Shelley racked up 380 penalty minutes, made up of major penalties
( 5 minutes each) and minor penalties
(2 minutes each). There were 136 penalties in total.

How many of each type did he have?

BCS BSC CBS CSB SBC SCB $\rightarrow 6$ possibilities OR

There are 3 possibilities for $1^{\text {st }}$ in line
$\times 2$ possibilities for $2^{\text {nd }}$
$\times 1$ person left for $3^{\text {rd }}$
$=6$ in total

## Solution to Grade 7 Question 2

$$
0,3,8,15,24,35, \ldots, 63,80,89
$$

To get the next number, you add:

$$
\begin{array}{lllllll}
3 & 5 & 7 & 9 & 11 & 17 & 19
\end{array}
$$

The missing pieces here are 1315

So, $35+13=48$ and $48+15=63$ confirms that the missing number is 48 .
The 3 numbers are 2,4,6.

Solution to Grade 7 Question 3
\#of lily pads on any day=2(\#of lily pads previous day) SO,
\# of lily pads on $39^{\text {th }}$ day $=\frac{1}{2}$ (\# on $40^{\text {th }}$ day) $=\frac{1}{2}$ full
On $39^{\text {th }}$ day, pond is half-full.

Solution to Grade 7 Question 4
From Halifax->700
Not from HLfx and cheering for St.F.X->300
Remainder->100
There are 100 people in this category.

Solution to Grade 7 Question 5
L->\# of lower deck tickets
U->\# of upper deck tickets
One upper + One Lower $=300$

$$
600000) 300=2000
$$

There are 2000 of each.

## Solution to Grade 8 Question 1

$\frac{24}{60}=40 \% \quad \frac{21}{30}=70 \% \quad \frac{85}{100}=85 \%$

$$
(40+70+85)) 3=65
$$

His average is $65 \%$.

Solution to Grade 8 Question 2
$1-\frac{5}{9}=\frac{4}{9} \quad \frac{1}{2}$ of $\frac{4}{9}=\frac{2}{9}$
Two-ninths is left for Sara.

Solution to Grade 8 Question 3
(12 workers)(15 days)=180 worker days
180 workerdays )9 workers = 20 days.
20-15=5
It will take 5 extra days.

Solution to Grade 8 Question 4
d->Doug's age (yrs)
c->Christine's age (yrs)

$$
\begin{array}{rlr}
d=3 c+5 & & \\
d+c=45 & & \rightarrow 3 c+5+c=45 \\
& -> & 4 c+5=45 \\
& -> & 4 c=40 \\
& -> & c=10 \\
d=3(10)+5 & & \\
d=35
\end{array}
$$

Doug is 35 and Christine is 10 (yrs old).

| Day | Solution | to Gra | Question 5 |
| :---: | :---: | :---: | :---: |
|  | Alia's Daily | Alia's Total | Jimbo'sTotal |
| 1 | 1 | 1 | 50 |
| 2 | 2 | 3 | 100 |
| 3 | 4 | 7 | 150 |
| 4 | 8 | 15 | 200 |
| 5 | 16 | 31 | 250 |
| 6 | 32 | 63 | 300 |
| 7 | 64 | 127 | 350 |
| 8 | 128 | 255 | 400 |
| 9 | 256 | 511 | 450 |

After 9 days, Alia's total surpasses Jimbo's.

## Solution to Grade 9 Question 1

(11)(11)-(10)(10)

121-100
21
The numbers are 10 and 11.

| Solution to Grade 9 Question 2 |  |  |  |  |
| :---: | :---: | :---: | :---: | :---: |
| $2^{\text {nd }} 3^{\text {rd }}$ | $4^{\text {th }}$ | $5^{\text {th }}$ | $6^{\text {th }}$ | $7^{\text {th }}$ |
| $\times \quad \mathrm{X}+2$ | X+4 | X+6 | X+8 | X+10 |
| $2^{\text {nd }}+7^{\text {th }}=114$ |  |  |  |  |
| $x+x+10=114$ |  |  |  |  |
| $2 x+10=114$ |  |  |  |  |
| $2 x=104$ |  |  |  |  |
| $x=52$ |  |  |  |  |

The sum is: $X-2+X+X+2=3 X=3(52)=156$

Solution to Grade 9 Question 3
a->Jeremy's age today (yrs)
b->Jennifer's age today (yrs)

$$
\begin{array}{rlrl}
a+2=2 b & \rightarrow a=2 b-2 \\
a+3 b=93 & & \\
& ->2 b-2+3 b & =93 \\
& ->5 b-2 & =93 \\
& -> & 5 b & =95 \\
& -> & b & =19 \\
& \rightarrow a & =2(19) & -2
\end{array}
$$

Jeremy is 36 and Jennifer is 19 (years old).

## Solution to Grade 9 Question 4

## 2 possibilities for $1^{\text {st }}$ digit

$\times 2$ possibilities for $2^{\text {nd }}$ digit
$x 2$ possibilities for $3^{\text {rd }}$ digit
$=8$ different binary numbers

## Grade 9 Question 5

$$
13+12+25+2=52
$$



## Solution to Challenge Question 1

There must be 12 boys and 16 girls per class.
In 9 classes, there are 108 boys.

## Solution to Challenge Question 2

Let $x$ be the number of comic books that Arlene has.

Then Gloria has $\frac{x}{3}$. Marlene has $\frac{2 x}{3}$
And Joey has $\frac{2 x}{3}-7$, which equals $\frac{x}{5}$
Arlene has 15, Gloria has 5, Marlene has 10, and Joey has 3, totaling 33.

Solution to Question 3

$$
\begin{aligned}
& s=5^{2}+5^{2} \\
& s=\sqrt{50} \\
& A=(\sqrt{50})(\sqrt{50}) \\
& A=50
\end{aligned}
$$

# Solution to Challenge Question 4 

$$
\begin{aligned}
\text { Area } & =25 B-4 B=21 B \\
A & =21
\end{aligned}
$$

Solution to Challenge Question 5
$x$->\# of major penalties
$y$->\# of minor penalties

$$
\begin{array}{lll}
x+y=136->x=136-y & \\
5 x+2 y=380 & & ->5(136-y)+2 y=380 \\
& & ->680-5 y+2 y=380 \\
& & ->
\end{array} \quad 680-3 y=380
$$

There were 36 major and 100 minor penalties.

