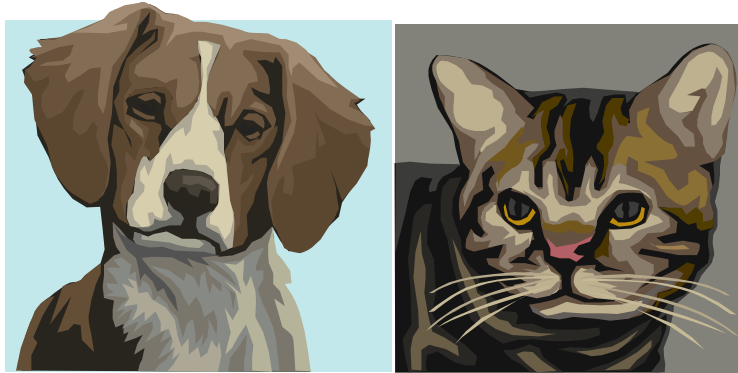# Grade 7 Regionals – Question 1
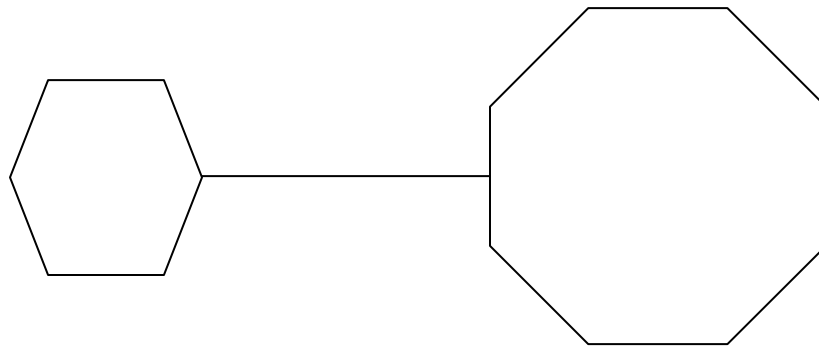
DOGSANDCATSDOGSANDCATSDOGSANDCATS…

What will be the 101st letter in the pattern?

Grade 7 Regionals – Question 2

A piece of wire was used to create the following shape, which includes two *regular* polygons. The length of the wire needed to make the entire diagram is 1 meter and 99 millimetres.

If the distance between the polygons is 15.3 cm and the length of a side on the hexagon is 4.7 cm, find the length of the side of the octagon in centimetres.

Grade 7 Regionals – Question 3

When Eye-Ree Member went to university, she was assigned a password to use on the computer system. The five digit password consisted of the digits 0, 1, 2, 3, and 9. She was told to memorize it and not write it down.

Eye-Ree decided to invent a reminder. She came up with this:

1) The sum of the first two digits is twice the sum of the last four, and
2) The sum of the three digits in the middle was twice the sum of the last two.

Predictably, on the first day of classes, Eye-Ree forgot her password.

USE HER REMINDER TO RECONSTRUCT THE PASSWORD.
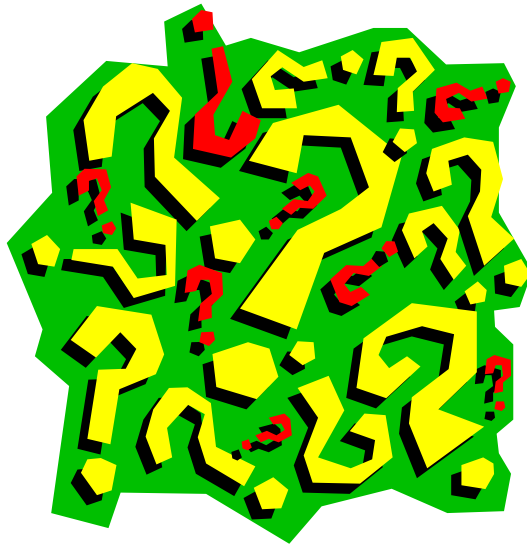
Grade 7 Regionals – Question 4

The local movie store has a gumball machine that contains red, green, yellow, and purple gumballs. Gumballs cost twenty-five cents each. If you get three gumballs of the same color, you will win a poster for your little sister!
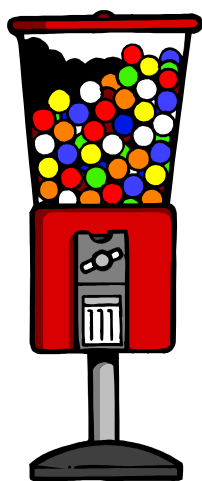
What is the minimum amount of money that you will need to put in the gumball machine to guarantee that you win the poster?

Grade 7 Regionals – Question 5

The factors of 60, many there be,
Are put in a hat, and one pulled free.
But the riddle that lies very close to heaven,
What is the probability it is less than 7?

Answer must be in *simplest* fractional form.

Regionals-Grade 7 Answers

1. 0

2. 8.3

3. 93102

4. 2.25

5. $\frac{1}{2}$

Grade 8 Regionals - Question 1

What is the largest 3-digit prime number that can be made with three different prime digits?

(Remember: One is not a prime number)

___ ___ ___

Grade 8 Regionals - Question 2

When 5 consecutive integers are added, their sum is 155.

? + ? + ? + ? + ? = 155

What is the *smallest* of these 5 consecutive integers.

Grade 8 Regionals - Question 3

The Dartmouth Whalers water cooler is 3/21 full of Gatorade. If the coach pours 6 more litres of Gatorade into the cooler, the cooler will be 6/14 full.

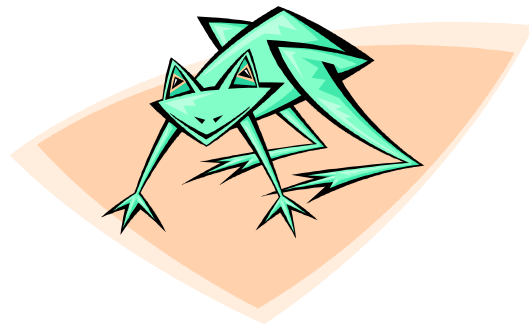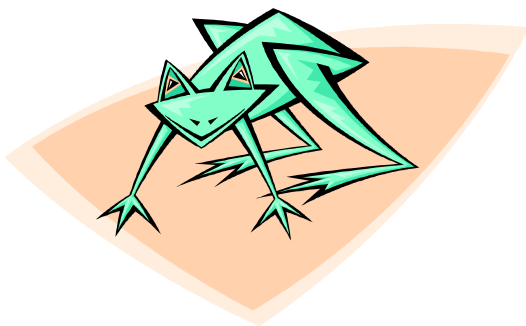What is the capacity of the water cooler?

Question 4

Adam and Sam decided to race their pet frogs. First, they have the frogs hop a 5 metre course and Adam's frog wins by 1 metre. Next, they hop a 6 metre race. Amazingly, both frogs hop at the same individual speeds that they hopped in the first race.

By how many metres will Adam's frog win the second race?

Grade 8 Regionals – Question 5

The triangular faces on King Tut's pyramid are all isosceles triangles where the height and the base of the face are the same measure.   The pyramid is square-based and each triangular face has an area of 72m^2.
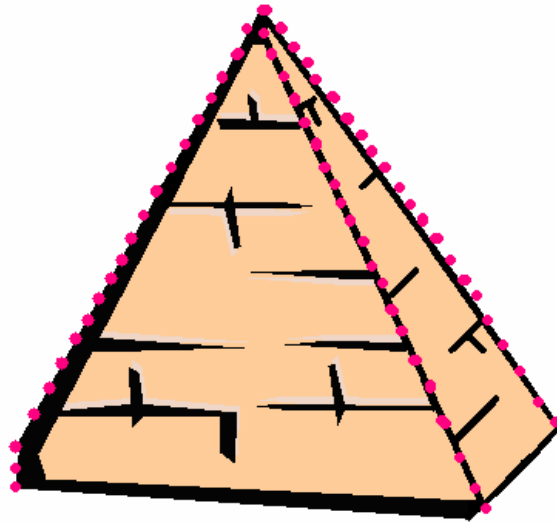
The curator for the museum needs to line the edges of the pyramid, excluding the base, with lights for the new exhibit. Each edge will be lined with a separate string of lights.

What is the total length of lights needed?
(Round your final answer to the nearest whole number)
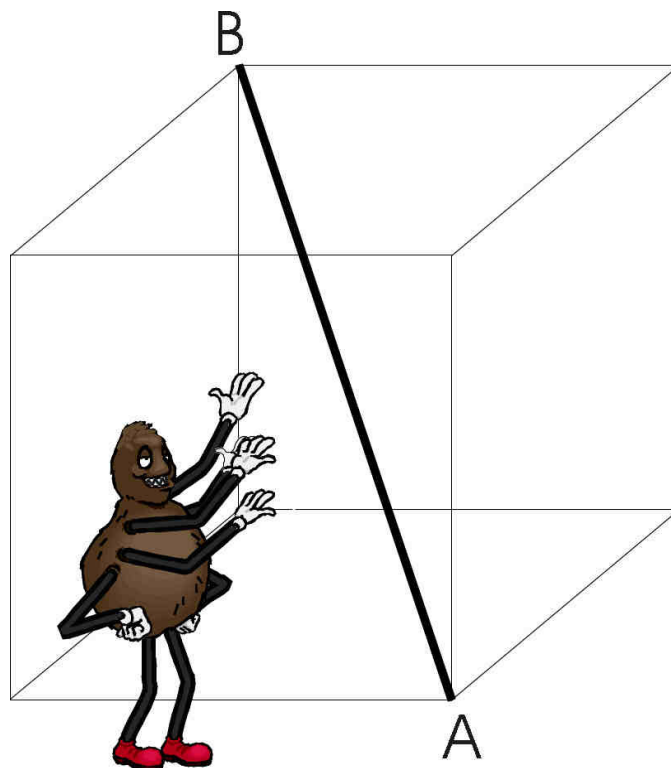
Grade 8 - Regional Answers

1. 523
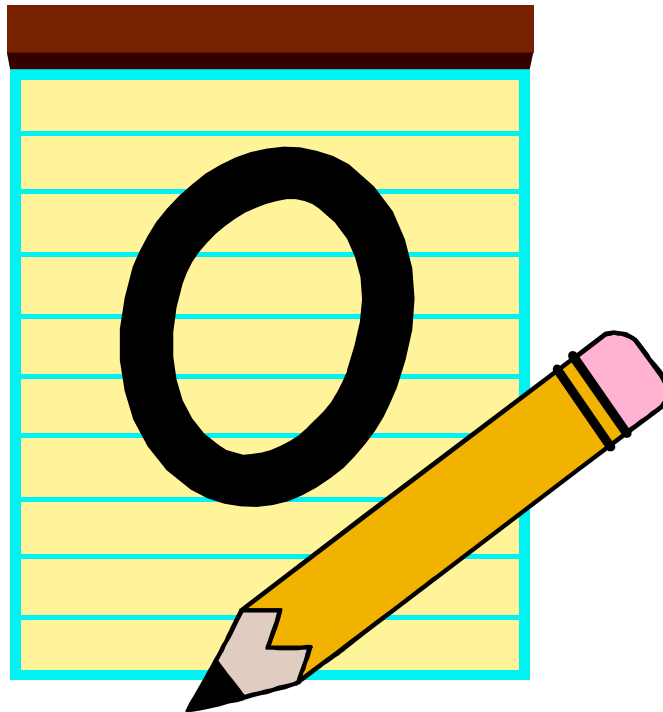
2. 29

3. 21

4. 1.2

5. 54

Grade 9 Regionals – Question 1

A spider made a thread stretching from corner A of a box to corner B. If the dimensions of the box are of equal length and that length is 100 cm, find the length of the thread? Round to the nearest whole number.
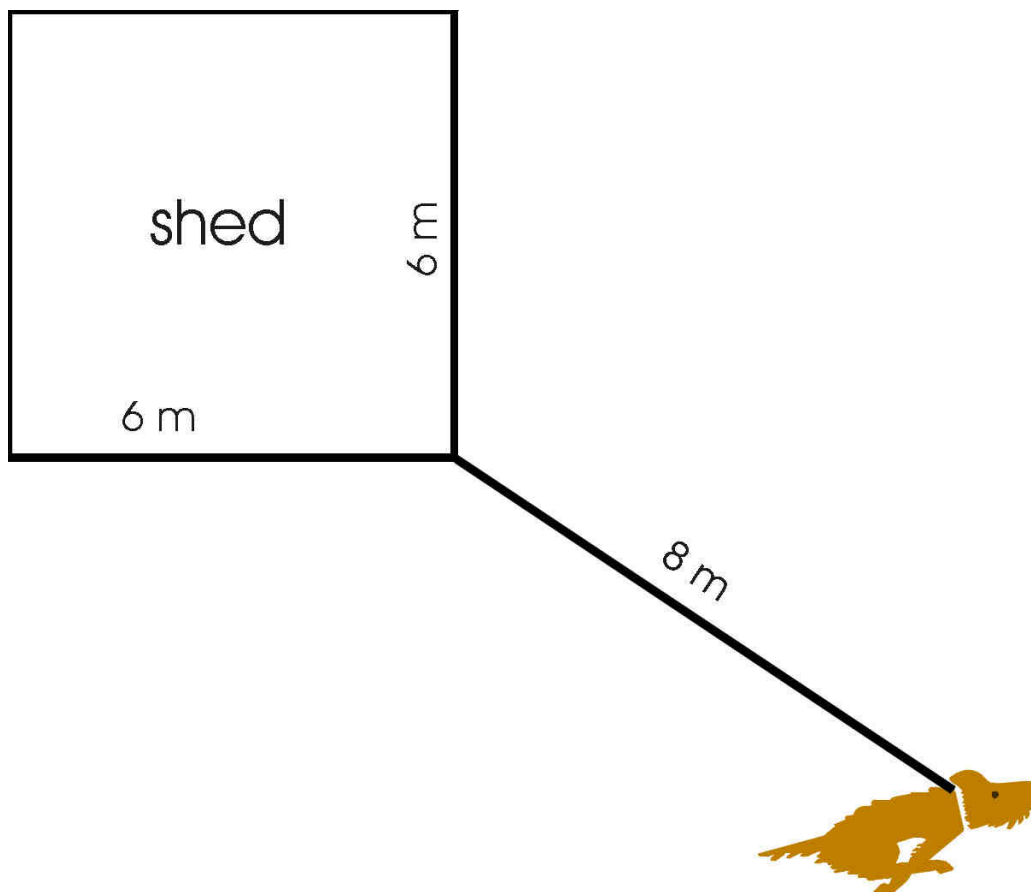
Grade 9 Regionals – Question 2

Find the number of zeros in $4^{12} \cdot 5^{20}$ when written in usual standard notation.
(Hint: $4 \cdot 5^2 = 100$)

Grade 9 Regionals – Question 3

Tylisha's dog is tied to the corner of a square shed, 6 metres on each side. The rope is 8 metres long.

What is the total area the dog can roam?
(Note: use π = 3.14)

Grade 9 Regionals – Question 4

Mai started school at Astral Drive Elementary when she was 5 years old. She stayed in school for $\frac{1}{4}$ of her life, and then started to work as a teacher at Madeline Symonds Middle School. After working for $\frac{1}{2}$ of her life, she retired. She then lived for 14 more years, which she spent traveling. How old was Mai when she retired?

Grade 9 Regionals – Question 5

ABCD is a rectangle, D is the center of the circle, and B is on the circle
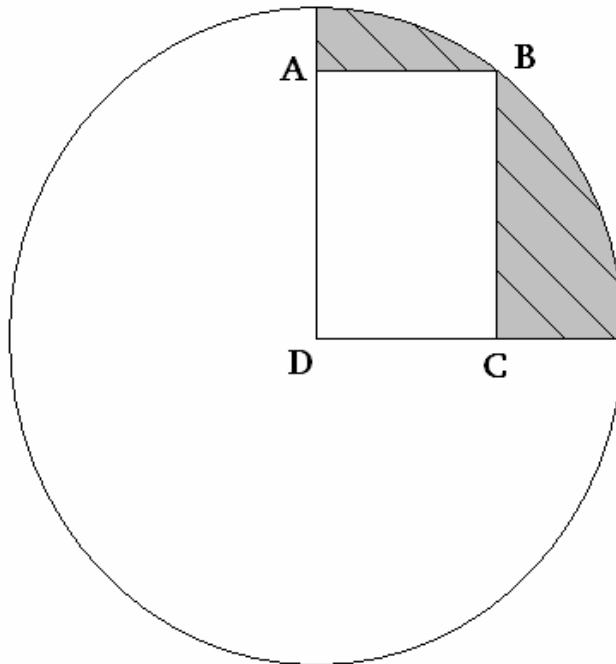
If AD = 4 and CD = 3, then the area of the shaded region is between which two consecutive integers?

Grade 9 - Regional Answers

1.   173

2.   20

3.   157

4.   62

5.   7 and 8

Regional Challenge 1

A packing company makes and sells boxes that have the following dimensions:

6 cm long, 5 cm wide, and 4 cm tall

They have been hired to package golf balls that come in boxes with the following dimensions:

3cm long, 2 cm wide, and 2 cm tall

What is the maximum number of packages of golf balls that will fit into one packing box?

Regional Challenge 2

Sally is going for a run. She is looking for a pair of running shoes to wear. The closet is dark and she cannot see the color of the sneakers in the closet. There are 3 pairs of black sneakers and 2 pairs of white sneakers. All sneakers are the same size and style.

What is the least number of sneakers that Sally must pull out to guarantee a *matched pair* to wear?
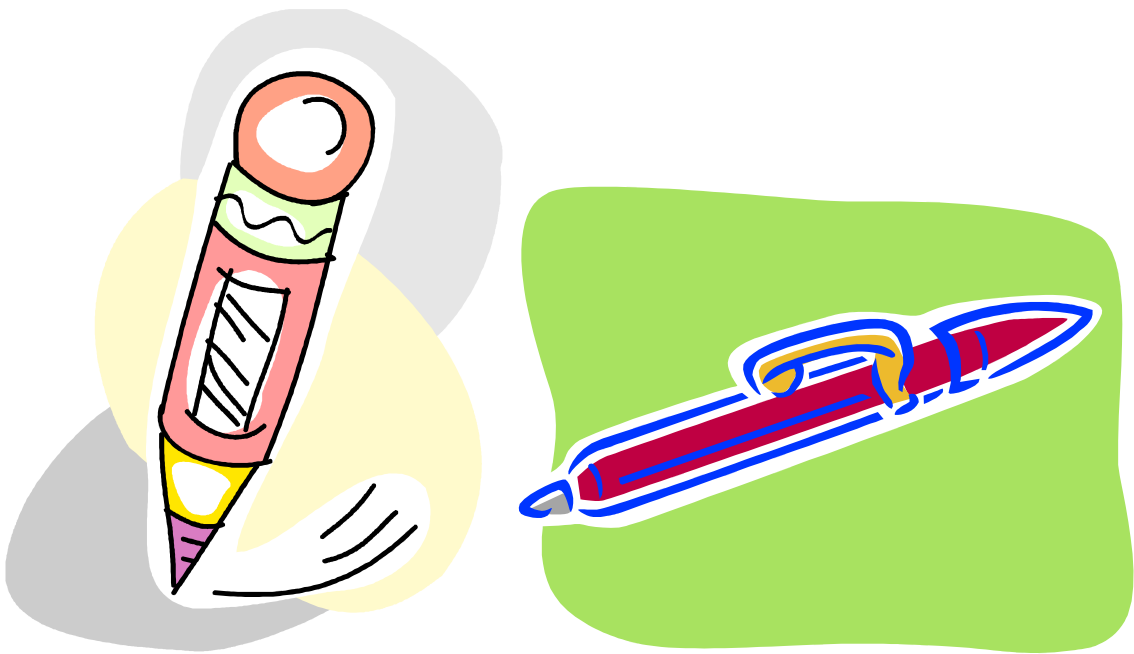
Regional Challenge 3

Dimitri has 6 different pairs of pants, 10 different shirts, 2 different belts, and 4 different neckties. Assume that wearing a tie and a belt is optional.

How many different outfits can Dimitri make from his wardrobe?
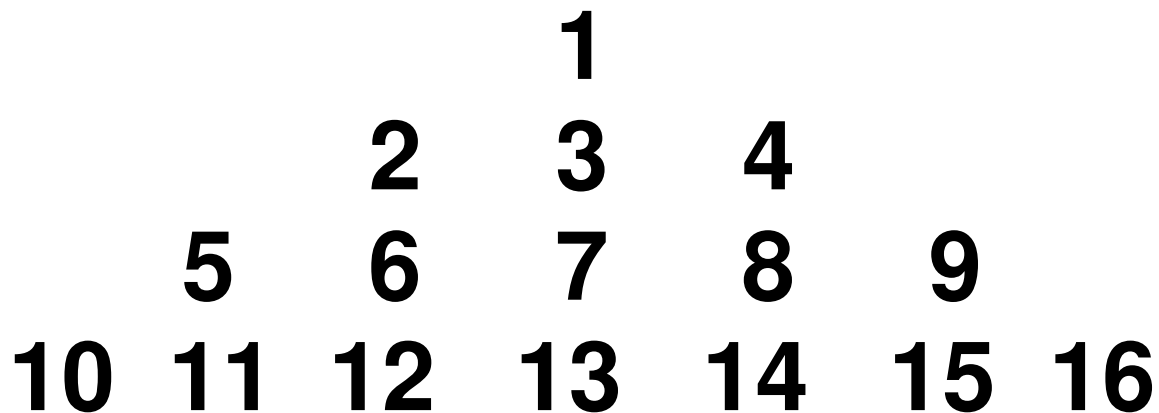
Regional Challenge 4

One pencil and two pens will cost 52 cents. Three pencils and one pen will cost 66 cents.

How much will one pen cost?

Regional Challenge 5

The seating arrangement for a concert has the following plan:

CONCERT STAGE

```
            1
        2   3   4
      5   6   7   8   9
   10 11 12 13 14 15 16
```

Suppose that seating arrangement continues in the pattern shown above. Shaquille O'Neal will be sitting in seat number 122 and will block the view of the person who sits behind him. The manager decides to leave the seat behind Shaquille O'Neal empty.

What is the number of that seat?

Regional Challenge Answers

1. 10

2. 6

3. 900

4. 18

5. 146

Grade 7 Zone – Question 1

Brad was racing his brand new car on the race track that was approximately 6500m long from the starting point of the track to the end point of the track.

If Brad's car is 4m in length, and it takes him four minutes from the time the front end of the car enters the track until the back of his car leaves the track, what is the average speed of his car in metres per second?
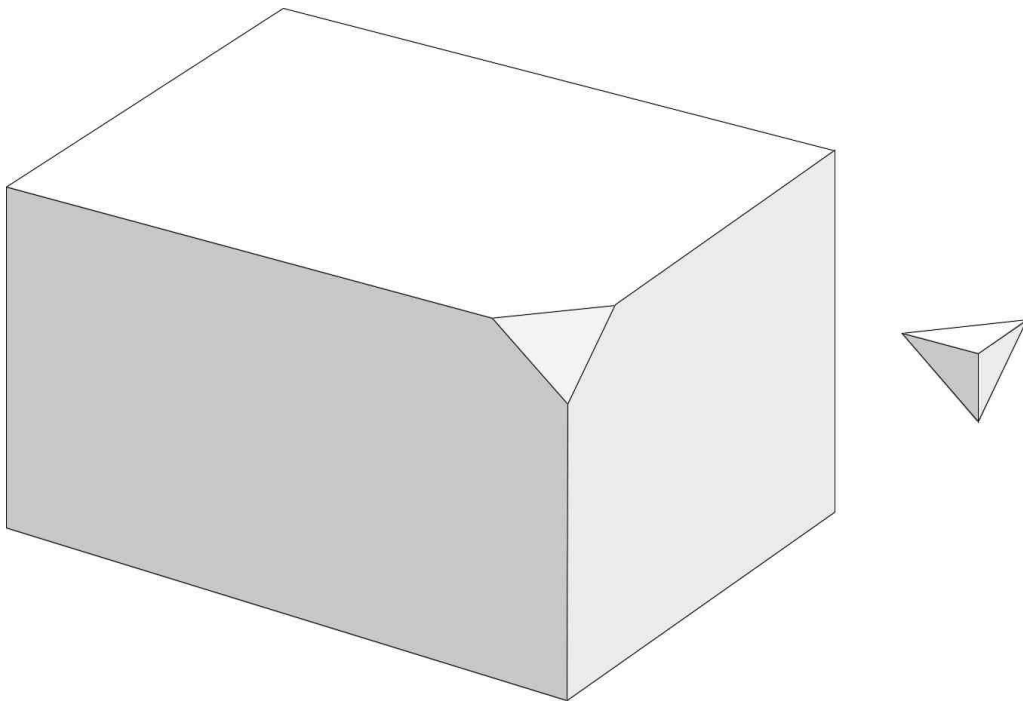
Grade 7 Zone – Question 2

Three ogres are having an argument about how to get the apples out of the tree. One decides to prove her strength by giving a nearby apple tree one good shake, knocking $\frac{1}{4}$ of the apples out of the tree. The second ogre shakes down $\frac{1}{3}$ of the remaining apples, and the third ogre shakes down $\frac{1}{2}$ of the apples that are left. In the end, only seven apples remain in the tree.
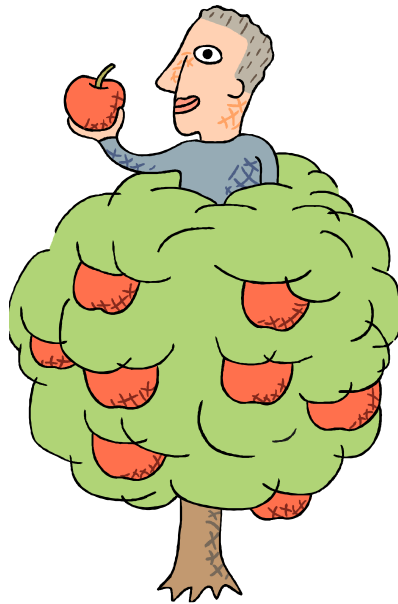
How many apples were on the tree to begin with?

Grade 7 Zone – Question 3

Each corner of a rectangular prism is to be cut off. One of the eight cuts is shown.

How many edges will the rectangular prism have after all eight cuts have been made?

Grade 7 Zone – Question 4
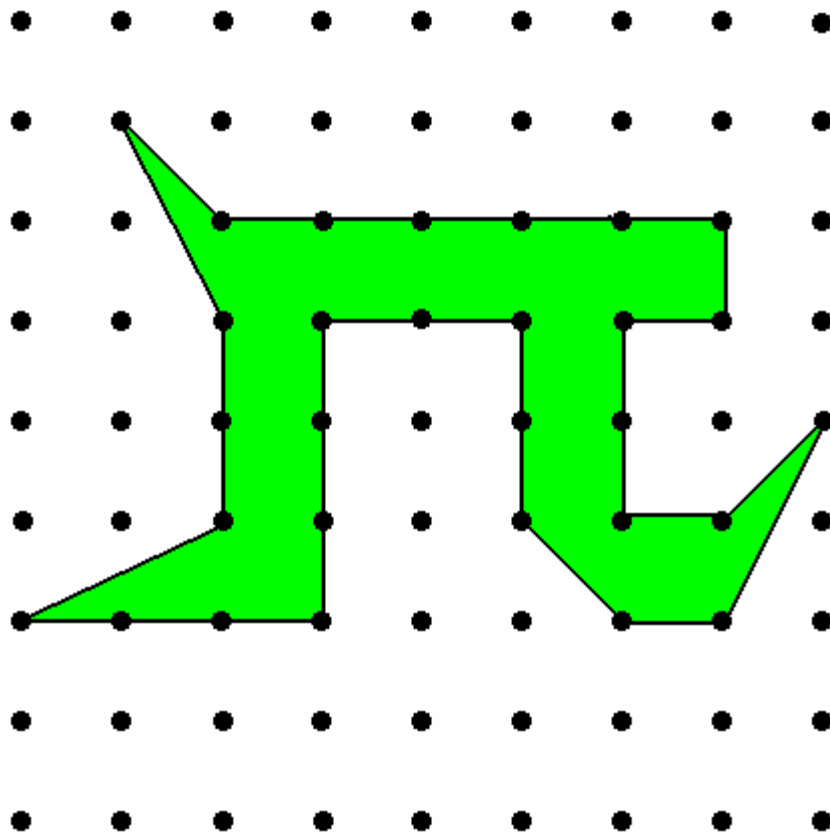
Sally's scarf is colored as follows: $\frac{1}{3}$ is orange, $\frac{1}{2}$ is yellow, and the remaining eight decimetres are green.

How long is the scarf, in decimetres?

Grade 7 Zone – Question 5

The following symbol was created on a geoboard.

Find the area enclosed by the symbol.

Grade 7 - Zone Answers

1. 27.1

2. 28

3. 36

4. 48

5. 13.5 or 13 ½

When a pitcher is $\frac{1}{3}$ full, it contains exactly enough water to fill three identical glasses.
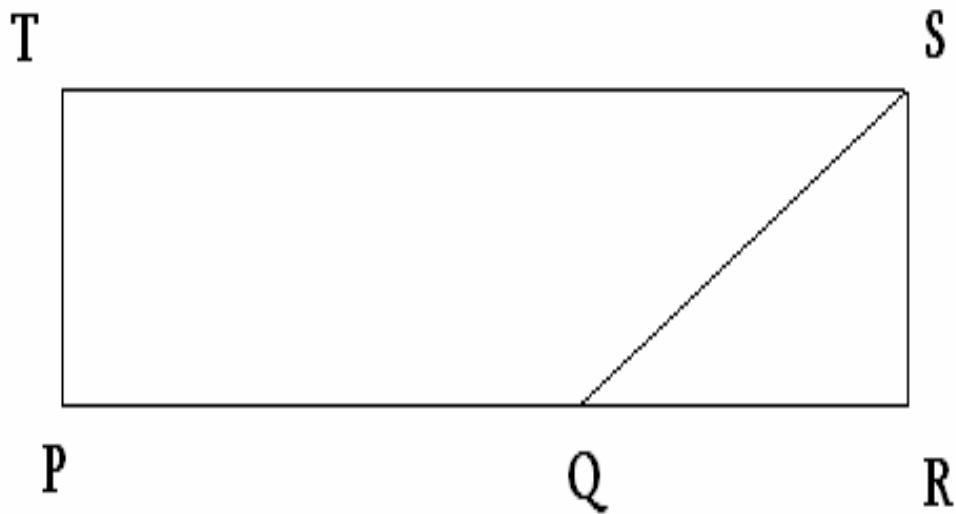
How full would the pitcher be if it had enough water to fill four of the same glasses?

Grade 8 Zone – Question 2

PQ is $\frac{3}{5}$ of PR.

The area of △ SQR is 15 cm².

Find the area of the rectangle PRST.

Grade 8 Zone – Question 3

Mr. Smith is a basketball coach for the local high school. The first day of try-outs was on Monday, where he cut $\frac{2}{9}$ of the students from the team. On Tuesday, he cut $\frac{3}{7}$ of the remaining students from the team. On the final day of try-outs, Wednesday, he cut $\frac{1}{4}$ of the remaining students to give him a team of 15 students.

How many students tried out for the team?

Grade 8 Zone – Question 4

Jill and Joey have agreed to shovel their grandparents' funky triangular-shaped driveway for a flat fee of $25. Their driveway is 50 square metres. Joey decided to get up early and shovel while Jill was still sleeping. He shoveled the triangular section of the driveway labeled ADC and then left to go play hockey with his friends. Jill had to shovel the rest of the driveway by herself. Later that day when they were to be paid, Joey wanted to split the money equally. Jill was not pleased with this deal and drew the diagram below to prove that she should be paid more.
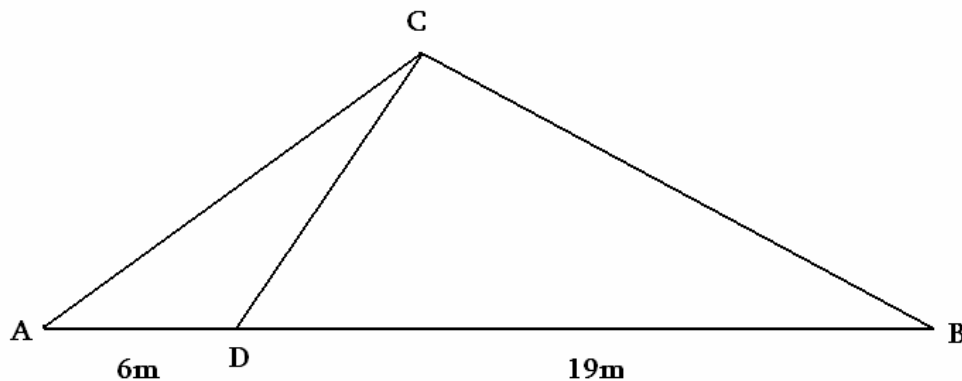
Exactly how much money should Jill be paid?

Grade 8 Zone – Question 5

When the six-digit number $3456n7$ is divided by 8, the remainder is 5.
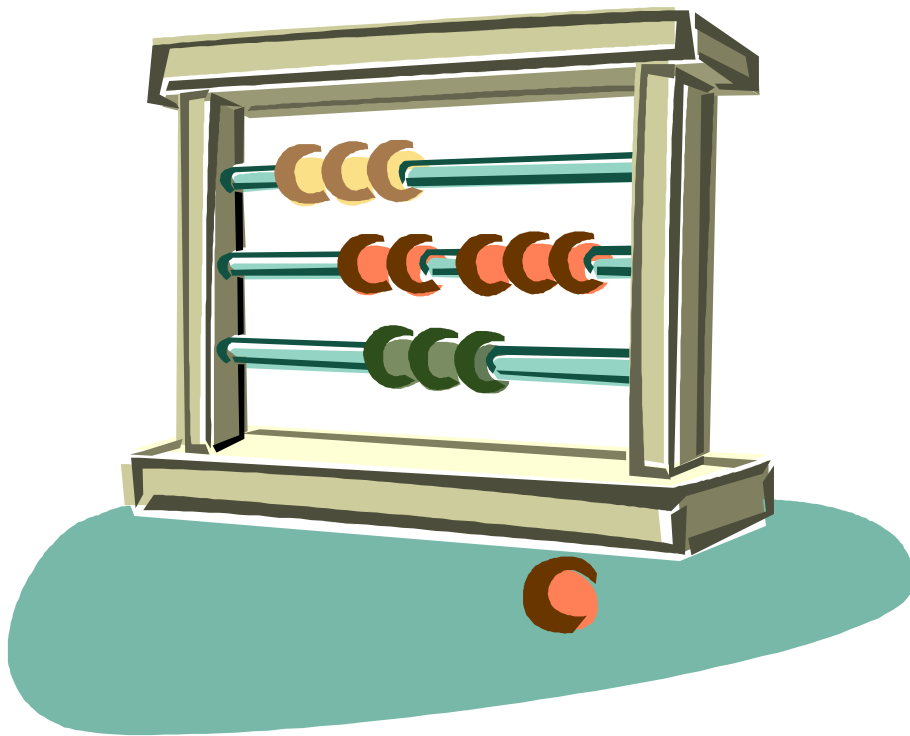
List both possible values of the digit n.

Grade 8 - Zone Answers

1. $\dfrac{4}{9}$

2. 75

3. 45

4. 19

5. 3 and 7

Grade 9 Zone – Question 1

While John is driving his car he notices that the odometer reads 13931 kilometres. This number is a palindrome, a number that reads the same forward as it does backward. Exactly two hours later, John notices the odometer displays a different palindrome. What is the most likely average speed at which the car has been traveling?

Grade 9 Zone – Question 2

The theatre at Dartmouth High has 18 rows of seats. Each row has the same number of seats. The theatre is going to be renovated to make room for a larger stage. The new theatre will have 3 fewer rows.

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ERROR: stackunderflow
OFFENDING COMMAND: ~

STACK:
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