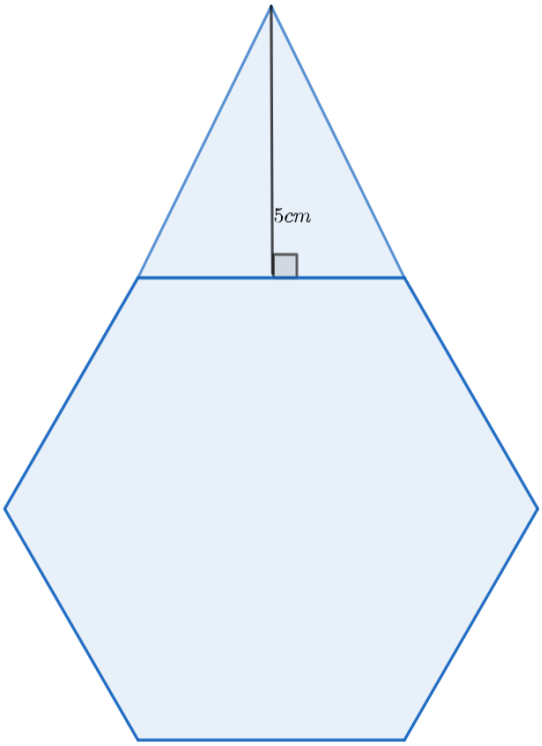
Round 1

Question 1

A house covers an area of $205m^2$. The area of the site for the house covers $10250000\ cm^2$. What is the ratio of the area of the house to the area of the site? Give your answer in the form $1:n$, where $n \in N$.

Question 2

The perimeter of a regular hexagon (with equal sides) is $72cm$. Calculate the area of the triangle that sits on top of the hexagon (see diagram). The height of the triangle is $5cm$.



Round 2

Question 1

152 teenagers were surveyed. The results of the surveys are as follows:

- 80 create videos for Instagram (I).
- 90 create videos for TikTok (T).
- 70 create videos for Snapchat (S).
- 40 create videos for both Instagram and TikTok.
- 30 create videos for both Instagram and Snapchat.
- 35 create videos for both TikTok and Snapchat.
- x teenagers create videos for all three platforms.

If there are 10 teenagers who do not create videos for any platform, calculate how many use Snapchat only?

Question 2

Solve

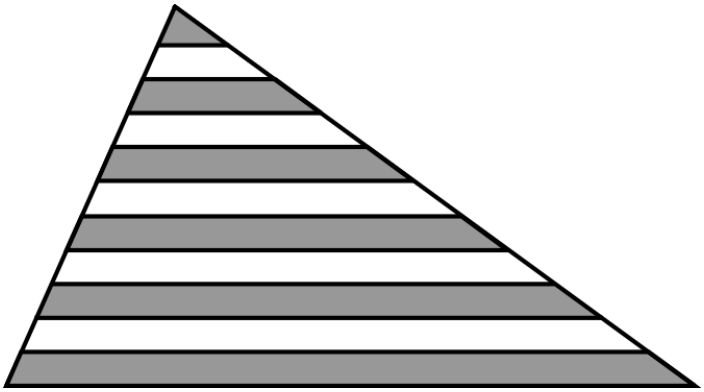
$$\frac{8^{\frac{2}{3}} \text{ x } 2^5}{64^{\frac{1}{2}} \text{ x } 4^2}$$

Give your answer in the form of $2^k, k \epsilon Z$

Round 3

Question 1

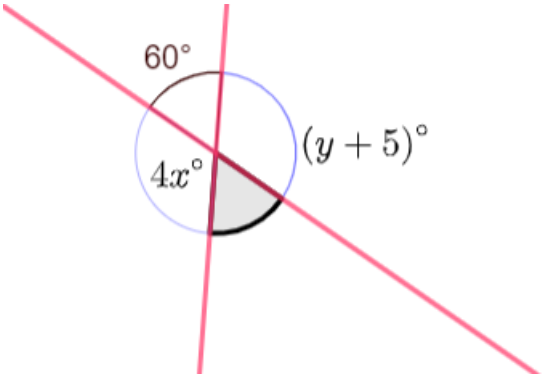
A triangle of area $770cm^2$ is divided into 11 regions of equal height by 10 lines that are all parallel to the base of the triangle. Starting from the top of the triangle, every other region is shaded, as shown.



What is the total area of the shaded regions?

Question 2

Calculate the values of x and y.



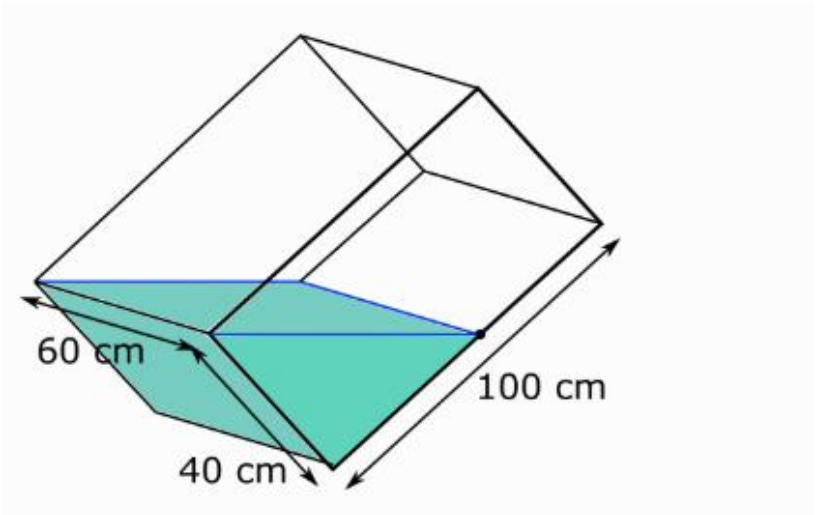
Round 4

Question 1

Paddy and Charlie paint at different but constant rates. Paddy can paint a room in 3 hours if she works alone. Charlie can paint the same room in 4 hours if he works alone. Paddy works alone for 2 hours and then stops. Charlie finishes painting the room. How many minutes will Charlie need to finish painting the room?

Question 2

A fish tank is a cuboid, 100 cm by 60 cm by 40 cm. It is partly filled with water, so that when it is resting on a 60 cm edge, the water level reaches the top edge and the midpoint of the base, as shown.



What will the height of the water be when the tank is resting on its base (a 100 cm by 60 cm face)?

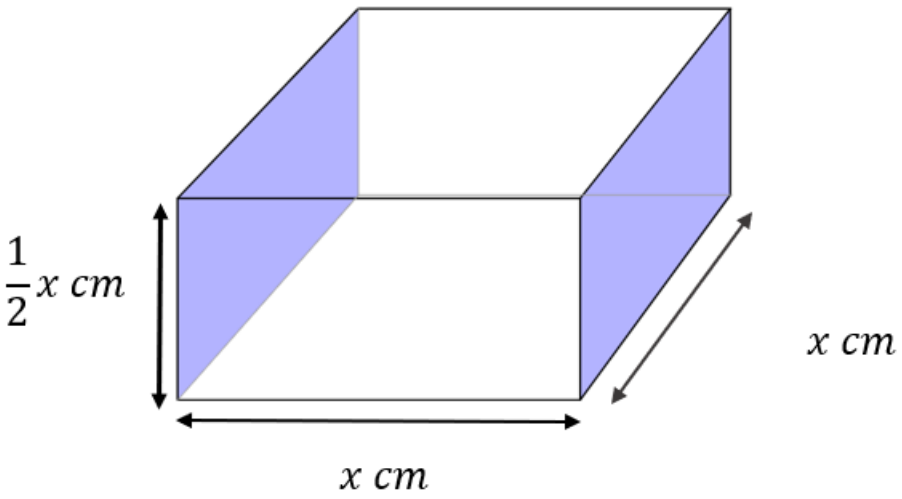
Round 5

Question 1

By selling a car for $€18920$, a loss of 12% was made on the purchase price. Calculate the purchase price.

Question 2

A cuboid has its volume equal to its surface area. Calculate the value of x in cm. The cuboid is a solid cuboid.

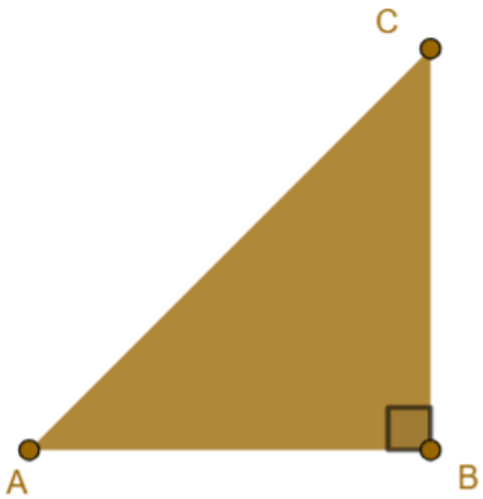


Round 6

Question 1

The slope of the hypotenuse $|AC|$ is equal to 1.

Calculate the size of the angle $|\angle BAC|$.



Question 2

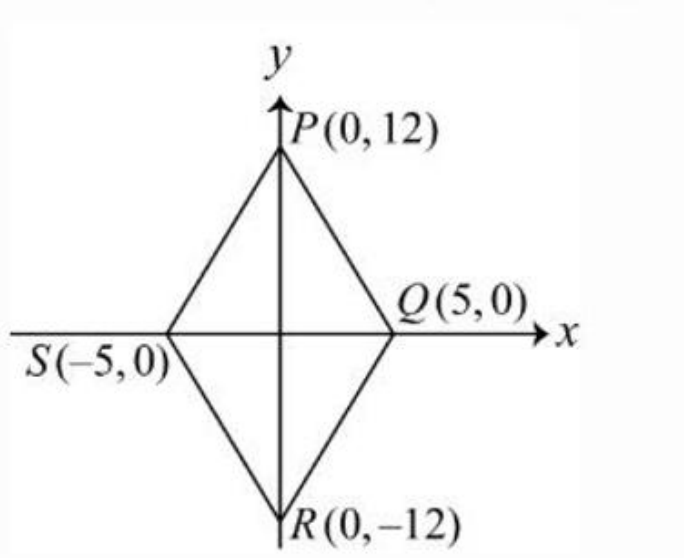
The Gallagher family and McGrath Family are neighbours. There are 4 members in the Gallagher Family. Their ages are: 29, 36, 60 and 64, ranging from youngest to oldest. There are 6 members in the McGrath family. Their ages are: 3, 7, 9, x, 40 and 40 from youngest to oldest.

The median age of the Gallagher family: McGrath family is given as a ratio 4:1. Find the value of x.

Round 7

Question 1

In the diagram $PQRS$ is a quadrilateral. Calculate the perimeter of the quadrilateral, where $P = (0,12), Q = (5,0), R = (0,-12)$ and $S = (-5,0)$.



Question 2

Calculate the difference between the third and the last term of the linear sequence below.

37				136	

Question 3

If $af = 6,\ fg = 1$ and $ag = 24$, then calculate the value of afg.
$a, g > 0, f \in Q$.

Question 4

Ciarán paid €7274 income tax for the year. He had a standard rate cut off point of €41600 and his tax credit was €6150. His standard rate of income tax was 20% and the higher rate was 40%. Calculate Ciarán's net income.

Round 8

Question 1

On Taylor's holiday, 11 days had some rain.

A morning rain was always followed by a clear afternoon.

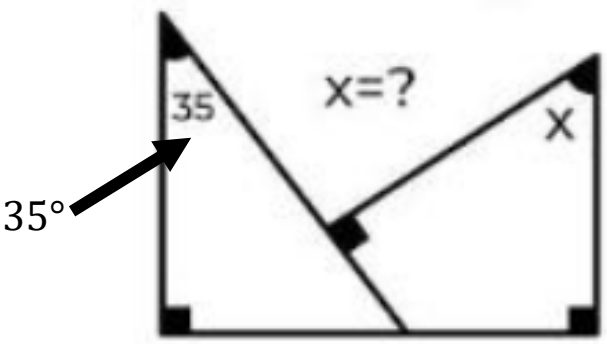
An afternoon rain was always preceded by a clear morning.

A total of 9 mornings and 12 afternoons were clear.

How many days had no rain at all?

Question 2

Calculate the value of x.

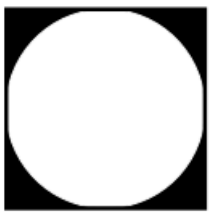


Question 3

Solve $6x^2 - 2x = 0$.

Question 4

A circle fits exactly inside a square of area $49cm^2$. Find the area of the shaded region. Round your answer to two significant figures.



π Quiz Regional Round– March 13th 2025

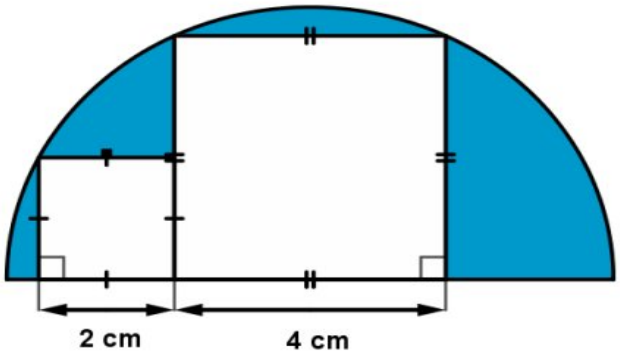
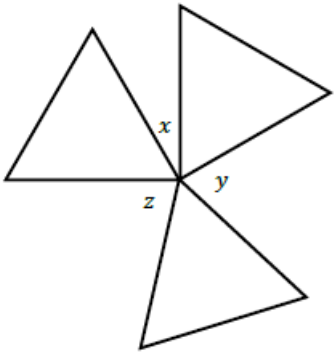
Answers

Round 1	
1	$1:5$
2	$30cm^2$ (units not required)
Round 2	
1	12
2	2^0 Do not accept 1 as answer requires 2^k
Round 3	
1	$420cm^2$
2	$x = 30°$ $y = 115°$ (degrees symbol not required)
Round 4	
1	80
2	$10cm$
Round 5	
1	€21500 (euro symbol not required)
2	8
Round 6	
1	$\lvert\angle BAC\rvert = 45°$ (angle notation or degree symbol not necessary)
2	15
Round 7	
1	52
2	74.25
3	12
4	€47086 (euro symbol not required)
Round 8	
1	5
2	55° (degree symbol not required)
3	$x = \frac{1}{3}$ **and** $x = 0$ (**Both** required)
4	$11cm^2$ (units not required)

NOTE: Units MAY be used to distinguish teams which cannot be separated after BOTH tiebreaks have been used.

π Quiz Regional Round– March 13th 2025

Tie Break 1

1	Find the shaded area. The internal squares have side lengths $2cm$ and $4cm$. Round your answer to three decimal places. 
2	In a card game, a player draws 3 cards at random from a standard 52-card deck. What is the probability that all three cards are Hearts? Give your answer as a percentage to 2 decimal places. The cards are not replaced.
3	A sequence is: $\mathbf{1}, \mathbf{5}, \mathbf{11}, \mathbf{19}, \mathbf{29}, \ldots$ Find the general formula for the nth term of the sequence.
4	If the mean of x, y and 80 is 6 more than the mean of y, z and 80 ,calculate the value of $x - z$.
5	If the three triangles are equilateral, find $x + y + z$. x, y and z are three angles. 
6	Multiply out and simplify $(2x - 5)(x^2 + 2x - 5)$.
7	Write down the reciprocal of 5 and add the reciprocal of 8 to it.
8	Fionn wrote 4 consecutive integers on a whiteboard. Ciara came along and erased one of the integers. Fionn noticed that the sum of the remaining integers was 847. What integer did Ciara erase?
9	Estimate the mean age of the swimmers in a swimming pool during a training session, from the following grouped frequency table: Give your answer to one decimal place.
10	$U = \{2,3,4,5 \ldots \ldots 30\}$ $A = \{multiples\ of\ 2\}$ $B = \{multiples\ of\ 3\}$ $C = \{multiples\ of\ 5\}$ Find $\#(AUBUC)'$

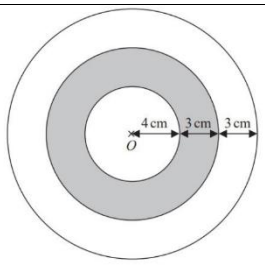
Age	**0-20**	**20-30**	**30-50**	**50-80**
Frequency	24	16	41	15

Answers to Tie Break 1

1	$11.416\ cm^2$
2	1.29%
3	$n^2 + n - 1 = 0$
4	18
5	$180°$ (degree symbol not necessary)
6	$2x^3 - x^2 - 20x + 25$
7	$\frac{13}{40}$
8	283
9	33.9
10	7

π Quiz Regional Round– March 13th 2025

Tie Break 2

1	Simplify $$\frac{2x^2 + 4x - 30}{x - 3}, x \neq 3.$$
2	You have four identical bottles. The first is $\frac{1}{2}$ full of water, the second is $\frac{3}{4}$ full of water, the third is $\frac{7}{8}$ full and the fourth is $\frac{15}{16}$ full. If you pour water from the fourth bottle to completely fill each of the first three bottles, what fraction of the fourth will be full when you are finished?
3	Fiona invests $€5000$ in a savings scheme with a broker. She receives 5% interest on her investment p.a. The broker deducts 2.75% as a fee on all interest earned at the end of the year. How much will Fiona have in her savings account at the end of one year? Round your answer to the nearest euro.
4	Maria bakes 420 cakes. She bakes plain, carrot, lemon and chocolate cakes. $\frac{2}{7}$ of the cakes are plain. 35% of the cakes are carrot. The ratio of lemon cakes to chocolate cakes is 4:5. How many lemon cakes did she bake?
5	The diagram shows a logo. What percentage of the logo is shaded? 
6	A water tank is being filled by two pipes. Pipe A can fill the tank in 6 hours, and Pipe B can fill it in 8 hours. If both pipes are opened at the same time, how long will it take to fill the tank completely? Round the answer to the nearest minute.
7	Find the 100th term of the following linear sequence: $$1000, 748, 496, 244 \ldots\ldots$$
8	A student plays 2 matches in a darts tournament. The probability that he wins the first is 0.56 and the probability that he wins the second match is 0.72. What is the probability that he loses both matches?
9	In a zoo, animals are categorised into Mammals, Birds, Reptiles, and Amphibians. A pie chart represents the distribution of these animals, with the following information: • The angle for mammals is 95°. • The angle for birds is x° • The angle for reptiles is twice the angle for Amphibians. • The angle for amphibians is $2x + 30°$. Given the information above, by finding the unknown angle x (the angle for birds) calculate the angle size of the reptiles in the zoo.
10	In a circle with radius 7 cm, a sector is formed with a central angle of 120°. Find the area of the sector in terms of π.

Answers to Tie Break 2

1	$2x + 10$ or $2(x + 5)$
2	$\frac{1}{16}$
3	€5243.12 *or* €5243.13
4	68 cakes
5	33%
6	3 hours and 26 minutes (to the nearest minute)
7	$T100 = -23948$
8	0.1232
9	160°
10	$\frac{49}{3}\pi cm^2$