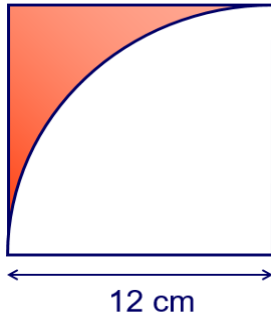


The π Quiz 2019 – Round 1

Irish Maths Teachers' Association, Cork Branch

Q1. Find the area of the shaded region of this square correct to 2 decimal places.



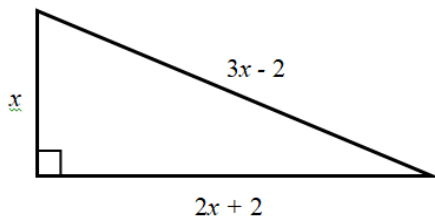
Q2. 10 litres of orange paint is made by mixing 4 litres of yellow paint with 6 litres of red paint. How many litres of red paint would be needed to mix with 14 litres of yellow paint to make the same shade of orange?

The π Quiz 2019 – Round 2

Irish Maths Teachers' Association, Cork Branch

Q1. At what point do the lines $2x + 3y = 1$ and $5x - 2y - 12 = 0$ intersect?

Q2. The lengths of the side of a right-angled triangle are given in the diagram. Find the value of x .



The π Quiz 2019 – Round 3

Irish Maths Teachers' Association, Cork Branch

- Q1.** Barry has a 3 year old car but wants to trade it in and purchase a new car. The new car will cost €24,432 but Barry wants to add some extras: metallic paint at €542, bluetooth at €275 and a tow bar at €547. All the prices include VAT except the tow bar which must have 23% VAT added onto it. The garage will give Barry €13,657 for his old car.
How much did Barry have to pay the garage to the nearest euro?
- Q2.** A person rolls two fair 6 sided dice. He adds together the number he rolls on both dice to get a total e.g. if he rolls a 1 on the first die and a 2 on the second die he has a total of 3 between the two dice.
What is the probability that he will roll a total which is a prime number? Give your answer in its simplest form.

The π Quiz 2019 – Round 4

Irish Maths Teachers' Association, Cork Branch

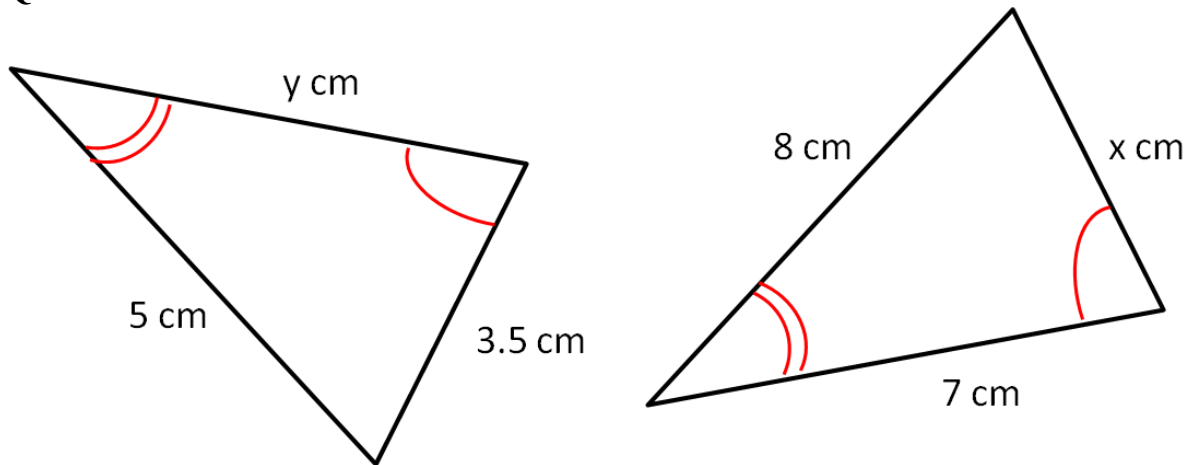
- Q1.** A wheel has a radius of 20 cm and rotates 150 times per minute.
Find how long it would take the wheel to travel 60 metres, to the nearest second.
- Q2.** At a restaurant a 'super meal' involves a salad being added to a basic meal. For example a 'super lasagne' comes with a salad while a lasagne does not.
On Friday the restaurant charged a family €60.30 for 2 cod dinners and 3 'super cod' and on Saturday it charged another family €97.20 for 5 'super cod' and 3 regular cod dinners.
What was the surcharge for a salad?

The π Quiz 2019 – Round 5

Irish Maths Teachers' Association, Cork Branch

- Q1.** A sphere just fits inside a cube of side $2r$.
Express the volume of unoccupied space in the cube as a percentage of the total volume of the cube. Give your answer correct to the nearest whole number.
- Q2.** Sharon pays Income Tax, Universal Social Charge and Pay Related Social Insurance on her gross wages. Her weekly gross wages are €590. She pays income tax at 20% and she has weekly tax credits of €57. She pays USC at the rate of 0.5% on the first €232, 2% on the next €151 and 4.5% on the balance. Her PRSI is €23.60.
What is her weekly take home pay correct to the nearest euro?

Q3.



Find the value of $x + 2y$.

- Q4** Given that $G = \frac{mn}{8} + K$, make n the subject of the formula.

The π Quiz 2019 – Round 6

Irish Maths Teachers' Association, Cork Branch

Q1. A line intersects the y axis at (0, 7) and has a slope of $\frac{1}{2}$.

Another line intersects the y axis at (0, 1) and has a slope of 2.

Calculate the area of the triangle bounded by these 2 lines and the y axis.

Q2. If $\frac{3 \times \sqrt{27}}{\sqrt[3]{3}} = 3^k$, find the value of $k \in \mathcal{Q}$.

Q3. Find the interquartile range of the following set of data:
28, 35, 20, 45, 34, 25, 40, 32

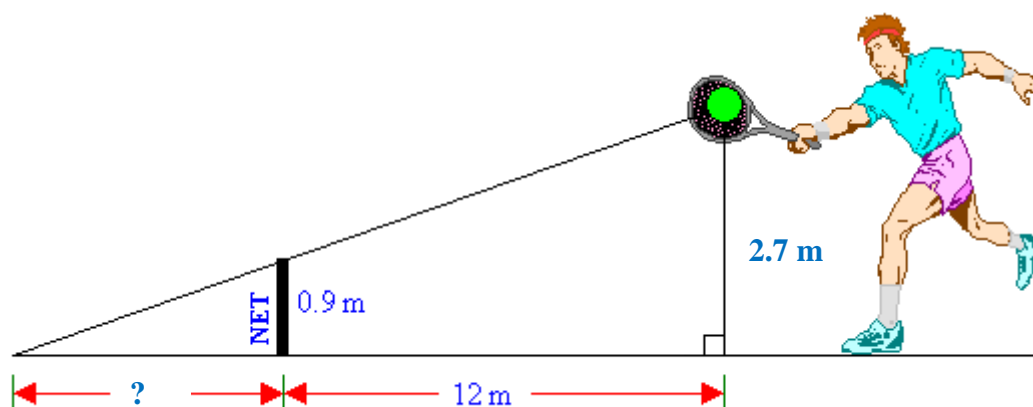
Q4 For the function $f : x \rightarrow \frac{1}{x^2 - 4}$, $x \neq \pm 2$, find the values of x such that $f(x) = \frac{4}{3}$.

Express your answer in the form $\frac{\sqrt{a}}{b}$, $a, b \in \mathcal{N}$.

The π Quiz 2019 – Round 7

Irish Maths Teachers' Association, Cork Branch

- Q1.** Jane has a special savings account for upgrading her kitchen. The new kitchen will cost her €14,500 plus VAT at 23%. The fitters will cost €40 per hour plus VAT at 13.5%. They will take 14 hours to complete the work. She purchases appliances at €2,300 plus 23% VAT.
- In the meantime, she sells her old kitchen on DoneDeal for €2,400 but delivery to the buyer costs Jane €130. She must also pay the fitter for a 3 further hours to remove the old kitchen.
- How much must Jane withdraw to cover her costs. Give your answer correct to the nearest cent?
- Q2.** A PE teacher has medals left over from last year's sports day in a box. There are x gold, 6 silver and 3 bronze medals. A student is asked to pick 2 medals from the bag at random and without replacement. If the probability of picking 2 gold medals is $\frac{1}{13}$, how many gold medals are in the box?
- Q3.** A tennis ball is hit from a height of 2.7 m above the ground. It just passes over a net of height 0.9 m as shown in the diagram below.
- How far away from the base of the net does the ball land?

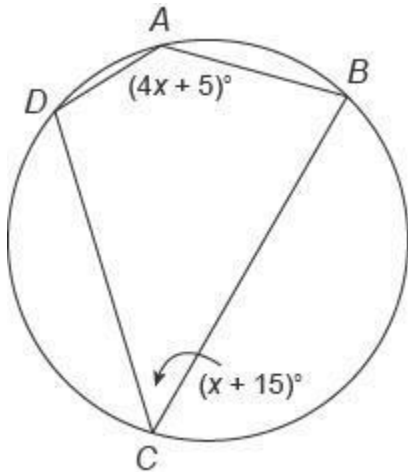


- Q4.** A car moves at an average speed of 48 km/hr for 1 minute. It then stops for 3 minutes before continuing at 36 km/hr for 9 seconds. Calculate the average speed in m/s of the complete journey. Give your answer correct to 3 significant figures.

The π Quiz 2019 – Round 8

Irish Maths Teachers' Association, Cork Branch

Q1. Find the measure of the angle DAB .



Q2. Thirty four students were asked if they had an ipad (I), a smartphone (S) or a computer (C). Seven responded that they had all three. Three had an ipad and a smartphone but not a computer. Five had a computer and a smartphone but not an ipad. Just one had an ipad and a computer but not a smartphone. Fourteen said that they owned an ipad. Twenty said that they had a smartphone while seventeen said that they had a computer.

Find $\# \left(C \cup (I \cup S)' \right)$.

Q3. The points $A(0, 12)$, $B(6, 0)$ and the origin $O(0, 0)$ lie on a circle whose centre is at C , the midpoint of AB .

Calculate $|\angle OCB|$. Give your answer correct to 2 decimal places.

Q4. The roots of a quadratic equation $ax^2 + bx + c = 0$ are k and $\frac{3k}{4}$, where

$k \in R, k \neq 0$.

Solve $c + b = 0$.

The π Quiz 2019 – Tie –break 1

Fill answers onto question page.

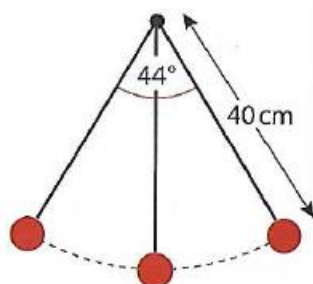
Irish Maths Teachers' Association, Cork Branch

Q1. What is the minimum point of the curve $f(x) = x^2 - 6x - 7$.

Q2. Miriam puts €2,000 into a savings account which has a compound interest rate of 2% for year 1, 4% for year 2, 4.5% for year 3. Miriam wants to go on holidays so at the end of year 1 she withdraws €500. She wins some money a year later at the local bingo so at the start of year 3, she lodges €1,445.

How much has she in her account at the end of year 3 to the nearest euro?

Q3. The total angle of swing of a particular pendulum is 44° (22° each way) as shown in the diagram.



Find the difference in height of the bottom of the pendulum at the lowest and highest points in the swing. Give your answer correct to the nearest cm.

Q4. The radius of the base of a cone and the radius of a sphere are each 5 cm in length. If the volume of the cone is equal to the volume of the sphere, find the height of the cone. _____

The π Quiz 2019 – Tie –break 2

Fill answers onto question page.

Irish Maths Teachers' Association, Cork Branch

Q1. One third of a two digit number is equal to the sum of its digits.
What is the number? _____

Q2. A cylindrical hole on a golf course is 10 cm in diameter and 12 cm deep. The hole is half full of water. A spherical golf ball of radius 2 cm is dropped into the hole. Find the new level of water, correct to 2 decimal places. _____

Q3. $x^2 - 2px + 3x - t = x^2 - 8x + 13$, find p and t . _____

Q4. Rugs are displayed in a carpet showroom as follows:

Display number	1	2	3	4
Number of rugs	1	3	6	10

If there are 36 carpets stacked in a certain display, what display number does this correspond to? _____

Answers

	Round 1	Round 2	Round 3	Round 4	Round 5	Round 6	Round 7	Round 8
Q1	30.90 cm ² or 30.9 cm ²	(2, -1)	€12,265	19 s	48	12 sq units	€19,165.80	133°
Q2	21 L	5	$\frac{5}{12}$	€3.60	€492	$\frac{13}{6}$	4	23
Q3					14.35 or $\frac{287}{20}$	11	6 m	53.13°
Q4					$\frac{8(G - K)}{m}$ or $\frac{8G - 8K}{m}$ or $\frac{8G}{m} - \frac{8K}{m}$	$\pm \frac{\sqrt{19}}{2}$	3.57 m/s	$k = \frac{7}{3}$

Tiebreak 1

Q1 (3, -16)

Q2 €3184

Q3 3

Q4 20 cm

Tiebreak 2

Q1 27

Q2 6.43 cm

Q3 $p = \frac{11}{2}, t = -13$

Q4 8