AKCSE National Mathematics Competition 2024

Representative Questions and solutions

Grade 4

Intermediate

The following shapes have equal area and perimeter. What is the length of the side?

Answer: 1

Moderate

1. Rishi takes 25 minutes to read 17 pages of a book. How many minutes will it take her to read 100 pages?

Answer: 147mins

Advanced

2. David can run 4 km per hour. Tim can go 2 times faster than David if Tim rides his bicycle. David started running 30 minutes earlier than Tim. How long does Tim need to ride his bicycle to catch up with David ?
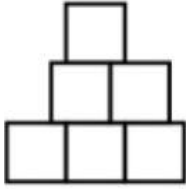
Answer: 30mins

Grade 5

Intermediate

There are 12 shelves in the library. Each shelf has 35 books. How many books are on the shelves?

Answer: 420

Moderate

6 squares with sides of length 1 to form the shape in the picture. What is the perimeter of the shape?
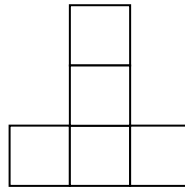
A) 11   B) 12   C) 13   D) 14   E) 10

Answer: B

Advanced

Sumin makes a structure with wood blocks as below. Front view, side view and back view of this wood block structure are all same. How many wood blocks does Sumin use?

Answer: 7

Grade 6

Intermediate

Find K if $63 \div K = 3$.

A) 18   B) 21   C) 27   D) 36   E) 40

Answer: B

Moderate

In an elementary school, there are 280 boys and 220 girls. What is the percentage of boys in the elementary school?

Answer: 56 %

Advanced

The distance between Larry and Madison is 1200 meters. Larry and Madison start walking toward one another and Madison's dog starts running back and forth between Madison and Larry at a speed of 80 meters per minute. Madison walks at the speed of 40 meters per minute while Larry walks at the speed of 60 meters per minute. What is the total distance the dog will have travelled when Harry and Kate meet each other?

Answer: 960 meters

Grade 7

Intermediate

A rectangular field is 80 m long and 44 m wide. If fence posts are placed at the corners and are placed at 8 m apart along the four sides of the field, how many posts are needed to completely fence in the field?

A) 31   B) 29   C) 32   D) 44   E) 27

Answer: A

Moderate

The next number in the sequence 1, 2, 5, 9, 16, 27 … is?

A) 56   B) 43   C) 45   D) 67   E) 49

Answer: C

Advanced

Ryan has fish in two aquariums. In one aquarium, the ratio of the number of guppies to the number of goldfish is 2:5. In the other this ratio is 3:4. If Ryan has 30 guppies in total, what is the minimum number of goldfish that he has?

Answer: 47 Goldfishes

Grade 8

Intermediate

Determine the value of $10 \times 10^4 + 1.67 \times 10^3 + 51$?

A) 110721   B) 116751   C) 101621   D) 101721   E) 11721

Answer: D

Moderate

If snow falls at a rate of 1 mm every 3 minutes in Calgary but 2 mm every 9 minutes in Toronto, then what is the difference in hours it takes for 1 m of snow to fall?

A) 100   B) 50   C) 25   D) 75   E) 110

Answer: C

Advanced

A fish tank is 60 cm high, 30 cm wide, and 25 cm deep. It is filled with 41.400 L of water. A rock that weighs 60 g is placed in the tank. What is the displacement of the height of water? Hints: $1 \text{ cm}^3 = 1$ mL; density of water = 1 g/cm^3; density of the rock = 2 g/cm^3.

Answer: 1cm

Grade 9

Intermediate

Ann's goal is to walk 10 km. She begins at 9:00 a.m. and walks at a steady rate of 2 km/h without a break. What is the distance still left to walk at 1:30 p.m.? (km=kilometer)

A) 5 km   B) 4 km   C) 3 km   D) 2 km   E) 1 km

Answer: E

Moderate

Twelve 1 by 1 squares from a rectangle, as shown. What is the total area of the shaded regions?
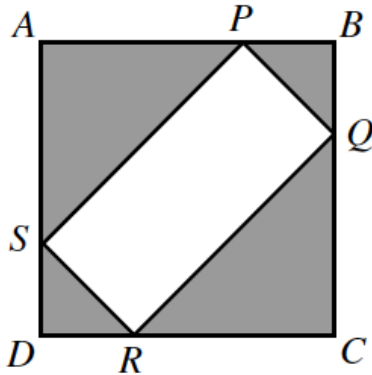
A) 8   B) 9   C) 10   D) 11   E) 12

Answer: C

Advanced

In the diagram, two pairs of identical isosceles triangles are cut off of square $ABCD$, leaving the rectangle $PQRS$. The total area cut off is 200 m^2. The length of PR, in metres, is?
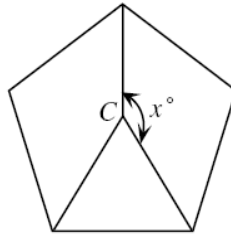

Answer: 20m

Grade 10

Intermediate

If r and s are the roots of $x^2 - 6x + 2 = 0$, then r + s=?

A) -3 B) 3   C) -6 D) 6   E) 2

Answer: D

Moderate

A regular pentagon with centre C is shown. The value of x is
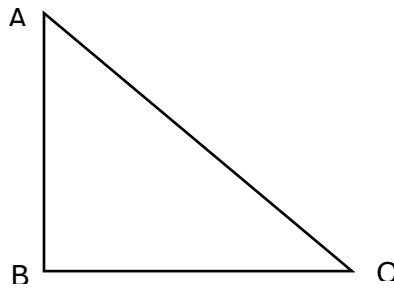

A) 144   B) 150   C) 120   D) 108   E) 72

Answer: A

Advanced

Consider a right triangle ABC, whose area is 50 and AB = BC. What is the area of largest semicircle which can be drawn completely within the triangle?

A) 50π B) 25π C) 25   D) 12.5π E) 12.5

Answer: D

Grade 11

Intermediate

An imaginary number i is defined as $\sqrt{-1}$. What is $i^1 + i^2 + \cdots + i^{2015} + i^{2016}$?

  A) $2016i$ B) 0 C) $\dfrac{2017}{i}$ D) i E) 1

Answer: B

Moderate

If $\sin\alpha + \cos\beta = \dfrac{1}{2}$ and $\cos\alpha + \sin\beta = \dfrac{1}{4}$, what is $\sin(\alpha + \beta)$?

Answer: $-\dfrac{27}{32}$

Advanced

What is the value of $\lim\limits_{x \to \infty} \dfrac{3 - 4x - 2x^3}{5x^3 - 8x + 1}$?

Answer: $-\dfrac{2}{5}$