## Algebra Questions

### Level 1 – 100 points

Simplify completely:  
5(2x - 3) - 3(4x - 5)  
  
Answer:  
10x - 15 - 12x + 15 = -2x

### Level 2 – 200 points

Solve for x:  
4(3x - 5) - 2(x + 7) = 3x + 1  
  
Answer:  
12x - 20 - 2x - 14 = 3x + 1 → 10x - 34 = 3x + 1 → 7x = 35 → x = 5

### Level 3 – 300 points

Simplify fully:  
(3x - 6)/6 + (x + 2)/3  
  
Answer:  
Make common denominator 6:  
(3x - 6)/6 + 2(x + 2)/6 = (5x - 2)/6

### Level 4 – 400 points

Solve for x:  
(2x - 3)/5 + (x + 4)/3 = 4  
  
Answer:  
Multiply through by 15:  
3(2x - 3) + 5(x + 4) = 60 → 6x - 9 + 5x + 20 = 60 → 11x + 11 = 60 → x = 49/11 ≈ 4.45

### Level 5 – 500 points

The product of two consecutive integers is 30. Form and solve an equation to find the integers.  
  
Answer:  
Let the smaller integer be x.  
x(x + 1) = 30 → x² + x - 30 = 0 → (x + 6)(x - 5) = 0 → x = -6 or 5 → Integers are (-6, -5) or (5, 6).

## Geometry Questions

### Level 1 – 100 points

A triangle has sides 7 cm, 24 cm, and 25 cm. Verify if it’s a right triangle, then find its area.  
  
Answer:  
7² + 24² = 49 + 576 = 625 = 25² → Right triangle.  
Area = 1/2 × 7 × 24 = 84 cm²

### Level 2 – 200 points

A regular polygon has each interior angle 150°. Find the number of sides.  
  
Answer:  
((n - 2) × 180)/n = 150 → 180n - 360 = 150n → 30n = 360 → n = 12

### Level 3 – 300 points

A circle has radius 9 cm. Find the length of an arc with a central angle of 100°, and the area of the corresponding sector (π = 3.14).  
  
Answer:  
Arc length = (100/360) × 2πr = 15.7 cm  
Area = (100/360) × πr² = 70.7 cm²

### Level 4 – 400 points

In triangle ABC, AB = 10 cm, AC = 7 cm, and ∠A = 65°. Find the length of BC using the cosine rule.  
  
Answer:  
BC² = 10² + 7² - 2(10)(7)cos65° = 89.78 → BC = 9.48 cm

### Level 5 – 500 points

A circle has a chord AB = 12 cm and radius r = 10 cm. Find the distance from the centre of the circle to the chord.  
  
Answer:  
Let M be the midpoint of AB.  
AM = 6 cm.  
r² = OM² + AM² → 10² = OM² + 6² → OM² = 64 → OM = 8 cm.

## Puzzle Questions

### Level 1 – 100 points

If you have 30 red socks, 20 white socks, and 10 blue socks, how many will you pick to get at least 1 matching pair without looking?

Answer: 4

### Level 2 – 200 points

Using only addition, combine eight 8s to make the number 1,000.  
  
Answer: 8 + 8 + 8 + 88 + 888 = 1000

### Level 3 – 300 points

Image

Answer: 179

Level 4 – 400 points

Image

Answer: The number on the left multiplied by 5 gives the sum of the other 2

### Level 5 – 500 points

How can you make 720 using exactly six zeros and any mathematical operators?

Hint: Use the “!” operator (0! = 1)

Answer:

(0!+0!+0!+0!+0!+0!)!=720

**Trigonometry**

Level 1 – 100 points

Answer: z=10.1

Level 2 – 200 points

Answer: x=94.1, y=94.1

Level 3 – 300 points

Answer: x=46.3

Level 4 – 400 points

Answer: 8.6

Level 5 – 500 points

Answer: 7.94

**Mensuration**

Level 1 – 100 points

Answer: 22

Level 2 – 200 points

Answer: 18

Level 3 – 300 points

Answer: 51

Level 4 – 400 points

Answer: 26.1

Level 5 – 500 points

Answer: 10.67