**Numeric Entry Practice Test 5**

**Question 1**

**Find (r-x), if 2P(5,3) = P(r,4) and P(9,5) + 5P(9,4) = P(10,x)**

**Correct Answer: 360**

**Explanation:**

2P(5,3) = P(r,4)
2\*5!/(5-3)! = r!/(r-4)!
2\*5!/2! = r(r-1)(r-2)(r-3)(r-4)!/(r-4)!
5! = r(r-1)(r-2)(r-3)
r = 5

P(9,5) + 5P(9,4) = P(10,x)
9!/(9-5)! + 5\*9!/(9-4)! = 10!/(10-x)!
9!/4! + 5\*9!/5! = 10!/(10-x)!
2\*9!/4! = 10\*9!/(10x)!
1/4! = 5/(10-x)!
5! = (10-x)!
5 = 10-x
x = 5

(r-x) = 5-5 = 0

**Question 2**

**The average of 6 observations is 12. When the seventh observation is added the average decreases by 1. Find the seventh observation.**

**Correct Answer: 5**

**Explanation:**

Let the seventh observation be x.
Average = sum of observations/number of observations
Sum of observations = 12\*6 = 72
The new average is 12-1 = 11
Sum of observations = 72 + x
Number of obervations = 6+1 = 7
11 = (72+x)/7
77 = 72+x
x = 77 - 72 = 5
The seventh observation is 5

**Question 3**

**How many sides does a polygon with 44 diagonals have?**

**Correct Answer: 11**

**Explanation:**

Let the number of sides be x.
The number of diagonals is given by x(x-3)/2
x(x-3)/2 = 44
x2-3x-88=0
x2 -11x+8x-88=0
x(x-11)+8(x-11)=0
x=-8,11
Since x cannot be negative, x = 11
The polygon has 11 sides.

**Question 4**

**Pam bought some apples for Rs.110. Had the shopkeeper given him one extra apple, each apple would have cost him Re.1 lesser. How many apples did he buy?**

**Correct Answer: 10**

**Explanation:**

Let the number of apples bought be x.
Price per apple = 110/x
Had he bought 1 more, the number of apples would have been x+1 Price per apple would have been 110/(x+1) The apples would have costed Re.1 lesser. Hence, we have
110/(x+1) = 110/x-1
110/(x+1) = (110-x)/x
110x = (110-x)(x+1)
110x = 110x -x2+110-x
x2+x-110=0
x2+11x-10x-110=0
x(x+11)-10(x+11)=0
(x-10)(x+11)=0
x=10,-11
Rejecting negative value, we get x = 10
The number of apples bought was 10.

**Question 5**

**Find the length of the longest stick that can be filled in a cuboid of length 12 cm, breadth 5 cm and height 84 cm.**

**Correct Answer: 85**

**Explanation:**

The longest possible stick that can be fitted shall be along the diagonal of the cuboid.
Diagonal of a cuboid with length, breadth and height as l, b and h is given by
sqrt(l2+b2+h2)
= sqrt(122+52+842)
= sqrt(144+25+7056)
= sqrt(7225)
= 85
The length of the stick should be 85 cm.

[l2=l\*l]

**Question 6**

**The length of the square is increased by 30%. The breadth of the square is increased by 20%. By what percent does the area of the rectangle exceed the area of the square?**

**Correct Answer: 56%**

**Explanation:**

Let the original side of the square be x units.
Area of square = side\*side = x2 sq.units
Length of the rectangle formed = x + 30% of x
= x + 30x/100 = 130x/100
Breadth of the rectangle formed = y + 20% of y
= y + 20y/100 = 120y/100
Area of the rectangle = length\*breadth
= 130x/100\*120x/100 = 156x2/100

Percentage increasse in area = (area of rectangle-area of square)/ area of square \*100
= (156x2/100 - x2)/x2\*100
= (156-100)/100\*100
= 56%
[x2=x\*x]

**Question 7**

**The sum of the squares of the numbers is 37/6 times their product. The sum of the numbers is 35. Find the difference of the two numbers.**

**Correct Answer: 25**

**Explanation:**

Let the two numbers be x and y such that x>y
x2+y2 = (37/6)xy...(1)
x + y = 35...(2)

We know that (x+y)2 = x2+y2+2xy
Substituting from (1) and (2), we get
352 = (37/6)xy + 2xy
1225 = (37xy+12xy)/6
49xy = 1225\*6
xy = 1225\*6/49
xy = 150
Putting x = 150/y in (2), we get
150/y + y = 35
150 + y2 = 35y
y2 - 35y +150=0
y2 - 30y - 5y +150=0
y(y-30) -5(y-30) = 0
(y-5)(y-30) = 0
y = 30,5

The two numbers are 30 and 5
x - y = 30 - 5 = 25
[x2=x\*x]

**Question 8**

**The item was listed at Rs 65 and sold at Rs. 56.16. Two successive discounts were given on the item and the first discount was 10%. Find the second discount percent.**

**Correct Answer: 4%**

**Explanation:**

Let the SP be the selling price and CP be the cost price of the item.
Let MP be the marked price.
For the first discount, the MP was Rs.65
SP = (100-discount%)\*MP/100
= (100-10)\*65/100
= 90\*65/100
= 58.50

For the second discount, the SP will be Rs. 56.16 and the MP will be Rs.58.50
56.16 = (100-discount%)\*58.50/100
100-Discount%= 96
Discount% = 4%

**Question 9**

**A man rows 12 km upsteram and 22 km downstream. He takes 5 hours to complete each part of his journey. What is the speed of the water in the stream?**

**Correct Answer: 1 km/hr**

**Explanation:**

Let the speed of the water in the stream be x km/hr.
Let the speed of the man in still water be y km/hr
When he goes upstream, the relative speed is (y-x) km/hr
When he goes downstream, the relative speed is (y+x) km/hr
According to the given conditions,
Distance = Speed \* Time
12 = (y-x)\*5...(1)
22 = (y+x)\*5...(2)
Subtracting (1) from (2), we get
22 - 12 = 5y + 5x -5y +5x
10 = 10x
x = 1km/hr
Speed of the water is 1 km/hr

**Question 10**

**Two numbers are in ratio 6:13. The least common multiple of the two numbers is 312. Find the sum of the two numbers.**

**Correct Answer: 76**

**Explanation:**

Let the two numbers be 6x and 13x.
LCM of 6x and 13x = 6\*13\*x = 78x
78x = 312
x = 312/78 = 4
The two numbers are 6\*4 and 13\*4
i.e. 24 and 52
The sum of the numbers is 24+52 = 76

**Question 11**

**Find the value of x3/y3+y3/x3 if x/y+y/x=6

[x2=x\*x]**

**Correct Answer: 88**

**Explanation:**

(x/y+y/x) = 6
(x/y+y/x)3 = 63
(x/y)3 + (y/x)3 +3(x/y\*y/x)(x/y+y/x) = 216
(x/y)3+(y/x)3 = 216 - 3\*6
= 216 - 18 = 198

**Question 12**

**Find a3/b3+b3/a3 if a2+b2=5ab.

[x2=x\*x]**

**Correct Answer: 110**

**Explanation:**

a2+b2=5ab
a2/ab+b2/ab=5ab/ab
a/b+b/a=5
(a/b+b/a)3=53
(a/b)3+(b/a)3+3(a/b\*b/a)(a/b+b/a) = 125
(a/b)3+(b/a)3=125-3\*5
a3/b3+b3/a3=125-15
=110

**Question 13**

**ABC is an isosceles triangle with AC=CB. A square whose one side is the altitude of the triangle from the vertex to the non-equal side has perimeter 140 cm. The area of the triangle is equal to 420 sq.cm. Find the length of the equal sides of the triangle.**

**Correct Answer: 37cm**

**Explanation:**

Let CD be the altitude of the triangle with D lying on AB, which is the base.
Side of square = perimeter/4
The altitude of the triangle will be = 140/4 = 35cm.
Area of triangle = 1/2\*base\*altitude
1/2\*base\*35 = 420
base = 2\*420/35
= 24cm

In triangle ADC, AD will be perpendicular to CD
AD = 24/2=12 and CD = 35
AC = sqrt(AD2+DC2)
= sqrt(122+352)
= sqrt(144+1225)
= sqrt(1369)
= 37 cm
Each of the equal sides in 37 cm long.

[x2=x\*x]

**Question 14**

**The lengths of the two diagonals of a rhombus are 72 cm and 30 cm. Find the length of each side.**

**Correct Answer: 39cm**

**Explanation:**

The diagonals of a rhombus bisect each other at right angles.
Hence, we get four right angled triangles with two sides 72/2 and 30/2 cm long
Hypotenuse of the triangle = sqrt(362+152)
= sqrt(1296+225)
= sqrt(1521)
= 39 cm
Each side of the rhombus is 39 cm long.

x2=x\*x]

**Question 15**

**In a groups of hens and cows, the number of heads is 48 and the number of feet is 140. How many cows are there in the group?**

**Correct Answer: 22**

**Explanation:**

Let the number of hens be x and the number of cows be y.
Accordng to the conditions
x+y=48...(1)
2x+4y=140...(2)
Multiply (2) by 2 and subtract from (2)
2x+4y-2x-2y=140-96
2y=44
y = 44/2=22
There are 22 cows in the group.