Q:1 Directions: Answer the questions based on the given information below.

Equation(i): $ax^2 + bx + c = 0$

Equation(ii): $py^2 + qy + c = 0$

The value of b is nineteen more than the value of q. The number which is placed in the place of p is 0.5 while the number which is placed in the place of a is 2. The value of c is 5 times the value of q. The value of q is 10.

Find the sum of the square of the roots of equation 1 is how much greater than 160.

1. 0.75
2. 0.25
3. 0.50
4. 0.40
5. 0.2

Q:2 Directions: Answer the questions based on the given information below.

Equation(i): $ax^2 + bx + c = 0$

Equation(ii): $py^2 + qy + c = 0$

The value of b is nineteen more than the value of q. The number which is placed in the place of p is 0.5 while the number which is placed in the place of a is 2. The value of c is 5 times the value of q. The value of q is 10.

Find the 50% of the average of the sum of the square of the roots of equation 2.

1. 100
2. 55
3. 45
4. 50
5. 40

Q:3 Directions: Answer the questions based on the given information below.

Equation(i): $ax^2 - bx - c = 0$

Equation(ii): $py^2 - qy - d = 0$

The value of c is seven times nine while the value of d is a cube root of 216. The value of a is 2 while the value of q is five more than the value of a. The value of b is equal to the value of p which is two less than the value of q.

Find which number is divisible by the sum of the positive roots of the equation.

1. 336
2. 405
3. 360

4. 379
5. 312

Q:4 Directions: Answer the questions based on the information given below.

John deposits Rs.500 in a bank at a compound interest rate of 5% for two years. At the same time, his friend Sarah invests an equal amount in another bank at a simple interest rate of 5% for the same years as John. The total interest earned by both John and Sarah is Rs.56.25 more than the value of c.

Equation(i): $2x^2 - 3x - 20 = 0$

Equation(ii): $y^2 - y - 20 = 0$

Find the sum of the square of the roots of equation 2 is how much greater than the sum of the square of the roots of equation 1.

1. 18.75
2. 17.75
3. 19.75
4. 16.75
5. 20.75

Q:5 Directions: Answer the questions based on the information given below.

John deposits Rs.500 in a bank at a compound interest rate of 5% for two years. At the same time, his friend Sarah invests an equal amount in another bank at a simple interest rate of 5% for the same years as John. The total interest earned by both John and Sarah is Rs.56.25 more than the value of c.

Equation(i): $2x^2 - 3x - 20 = 0$

Equation(ii): $y^2 - y - 20 = 0$

Find the conclusion that who is greater the values of x or the value of y.

1. x < y
2. x ≥ y
3. y ≥ x
4. x > y
5. x = y, or no conclusion

Answer Key

1. (2)	**2.** (4)	**3.** (2)	**4.** (1)	**5.** (5)

Answers and Solutions

Q:1 The correct answer is **Option 2** i.e. **0.25.**
Let us try to find out the values of the variables in the equations using the given information
The value of q = 10
The value of b is nineteen more than the value of q = 19 + 10 = 29
The number which is placed in the place of p is 0.5 = p = 0.5
The number which is placed in the place of a is 2 = a = 2
The value of c is 5 times the value of q = c = 5 × 10 = 50
So, the equations are
Equation(i): $2x^2 + 29x + 50 = 0$
Equation(ii): $0.5y^2 + 10y + 50 = 0$
Let's solve the equation one by one
Equation(i): $2x^2 + 29x + 50 = 0$
$2x^2 + 4x + 25x + 50 = 0$
$2x(x + 2) + 25(x + 2) = 0$
$(2x + 25)(x + 2) = 0$
$x = -25/2, -2$
Equation(ii): $0.5y^2 + 10y + 50 = 0$
$0.5y^2 + 5y + 5y + 50 = 0$
$0.5y(y + 10) + 5(y + 10) = 0$
$(0.5y + 5)(y + 10) = 0$
$y = -5/0.5, - 10$
$y = -10, -10$
Now, according to the question
Sum of square of Roots of equation 1 = $(-25/2)^2 + (-2)^2 = 625/4 + 4 = (625 + 16)/4 = 641/4 = 160.25$
Required difference = 160.25 - 160 = 0.25

Q:2 The correct answer is **Option 4** i.e. **50.**
Let us try to find out the values of the variables in the equations using the given information
The value of q = 10
The value of b is nineteen more than the value of q = 19 + 10 = 29
The number which is placed in the place of p is 0.5 = p = 0.5

The number which is placed in the place of a is 2 = a = 2
The value of c is 5 times the value of q = c = 5 × 10 = 50
So, the equations are
Equation(i): $2x^2 + 29x + 50 = 0$
Equation(ii): $0.5y^2 + 10y + 50 = 0$
Let's solve the equation one by one
Equation(i): $2x^2 + 29x + 50 = 0$
$2x^2 + 4x + 25x + 50 = 0$
$2x(x + 2) + 25(x + 2) = 0$
$(2x + 25)(x + 2) = 0$
$x = -25/2, -2$
Equation(ii): $0.5y^2 + 10y + 50 = 0$
$0.5y^2 + 5y + 5y + 50 = 0$
$0.5y(y + 10) + 5(y + 10) = 0$
$(0.5y + 5)(y + 10) = 0$
$y = -5/0.5, - 10$
$y = -10, -10$
Now, according to the question
The sum of the square of the roots of the second equation = $(-10)^2 + (-10)^2 = 100 + 100 = 200$
Average = 200/2 = 100
50% of 100 = 50

Q:3 The correct answer is **Option 2** i.e. **405.**
Let us try to find out the values of the variables in the equations using the given information
The value of c is seven times nine = 7 × 9 = 63
The value of d is a cube root of 216 = $\sqrt[3]{216}$ = 6
The value of a = 2
The value of q is five more than the value of a = 5 + 2 = 7
The value of b is equal to the value of p = 7 - 2 = 5
So, the equations are
Equation(i): $2x^2 - 5x - 63 = 0$
Equation(ii): $5y^2 - 7y - 6 = 0$
Let's solve the equation one by one
Equation(i): $2x^2 - 5x - 63 = 0$
$2x^2 + 9x - 14x - 63 = 0$
$x(2x + 9) - 7(2x + 9) = 0$
$(x - 7)(2x + 9) = 0$
$x = 7, -9/2$
Equation(ii): $5y^2 - 7y - 6 = 0$
$5y^2 - 10y + 3y - 6 = 0$
$5y(y - 2) + 3(y - 2) = 0$
$(5y + 3)(y - 2) = 0$

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$y = -3/5, 2$

Now according to the question

The sum of positive roots = 7 + 2 = 9

Now, from the options only option 2 i.e. 405 is divisible by 9

Q:4 The correct answer is **Option 1** i.e. **18.75.**

Interest$(C.I. + S.I.) = (P × R × T)/100 + P(1 + R/100)^2 - P$

Where, C.I. = Compound interest, S.I. = simple interest, P = principle, R = rate and T = time

Interest $= (500 × 5 × 1)/100 + 500(1 + 5/100)^2 - 500$

Interest $= 25 + 500(1 + 0.05)^2 - 500$

Interest $= 25 + 500(1.05)^2 - 500$

Interest $= 25 + 551.25 - 500$

Interest $= 76.25$

It is given that the value of c is 56.25 less than the total interest earned.

$c = 76.25 - 56.25 = 20$

Equation(i): $2x^2 - 3x - 20 = 0$

Equation(ii): $y^2 - y - 20 = 0$

On solving equation (i)

$2x^2 - 3x - 20 = 0$

$2x^2 - 8x + 5x - 20 = 0$

$2x(x - 4) + 5(x - 4) = 0$

$(2x + 5)(x - 4) = 0$

$x = -5/2, 4$

On solving equation (ii)

$y^2 - y - 20 = 0$

$y^2 - 5y + 4y - 20 = 0$

$y(y - 5) + 4(y - 5) = 0$

$(y + 4)(y - 5) = 0$

$y = -4, 5$

Now according to the question

The sum of the square of roots of equation 1 = $(-5/2)^2 + (4)^2 = 25/4 + 16 = (25 + 64)/4 = 89/4 = 22.25$

The sum of the square of roots of equation 2 = $(-4)^2 + (5)^2 = 16 + 25 = 41$

Clearly, the sum of the roots of equation 2 is $(41 - 22.25) = 18.75$ greater than the value roots of equation 2

Q:5 The correct answer is **Option 5** i.e. **x = y, or no conclusion.**

Interest$(C.I. + S.I.) = (P × R × T)/100 + P(1 + R/100)^2 - P$

Where, C.I. = Compound interest, S.I. = simple interest, P = principle, R = rate and T = time

Interest $= (500 × 5 × 1)/100 + 500(1 + 5/100)^2 - 500$

Interest $= 25 + 500(1 + 0.05)^2 - 500$

Interest $= 25 + 500(1.05)^2 - 500$

Interest $= 25 + 551.25 - 500$

Interest $= 76.25$

It is given that the value of c is 56.25 less than the total interest earned.

$c = 76.25 - 56.25 = 20$

Equation(i): $2x^2 - 3x - 20 = 0$

Equation(ii): $y^2 - y - 20 = 0$

On solving equation (i)

$2x^2 - 3x - 20 = 0$

$2x^2 - 8x + 5x - 20 = 0$

$2x(x - 4) + 5(x - 4) = 0$

$(2x + 5)(x - 4) = 0$

$x = -5/2, 4$

On solving equation (ii)

$y^2 - y - 20 = 0$

$y^2 - 5y + 4y - 20 = 0$
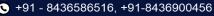
$y(y - 5) + 4(y - 5) = 0$

$(y + 4)(y - 5) = 0$

$y = -4, 5$

Value of x	Value of y	Conclusion
-5/2	-4	x > y
-5/2	5	y < x
4	-4	x > y
4	5	y < x

So, x = y, or no conclusion