Q:1 Directions: Three quadratic equations are as follows.

A. $2x^2 - 2x - \sqrt[3]{13824} = 0$

B. $3x^2 + 20x + \sqrt{1024} = 0$

C. $45x^2 + 75x - 30 = 0$

Find the sum of the square of the roots of equation A is how much greater than the sum of the square of the roots of equation C.

1. 13.75
2. 15.50
3. 12.25
5. 15.75

Q:2 Directions: Three quadratic equations are as follows.

A. $2x^2 - 2x - \sqrt[3]{13824} = 0$

B. $3x^2 + 20x + \sqrt{1024} = 0$

C. $45x^2 + 75x - 30 = 0$

Find the sum of the squares of all negative roots.

1. 445/9
2. 325/9
3. 443/7
5. 503/9

Q:3 Directions: Three quadratic equations are as follows.

A. $2x^2 - 2x - \sqrt[3]{13824} = 0$

B. $3x^2 + 20x + \sqrt{1024} = 0$

C. $45x^2 + 75x - 30 = 0$

Find the three times the sum of all positive roots.

1. 19
2. 11
3. 17
5. 15

Q:4 Directions: The roots of a quadratic equation are given:

1/4 and 3/5

What is the ratio of all positive roots of the original and newly formed quadratic equation?

1. 5 : 12 : 20
2. 7 : 12 : 15
3. 5 : 3 : 2
5. 5 : 20 : 12

Q:5 Directions: The roots of a quadratic equation are given:

1/4 and 3/5

If the quadratic equation derived from these given roots is divided by 4 and 0.25x - 1.75 added to it then, find the sum of the square of the quadratic roots of the newly formed quadratic equation.

1. 25/49
2. 27/25
3. 26/25
5. 25/27

Answer Key

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

Answers and Solutions

Q:1 The correct answer is **Option 5** i.e. **15.75.**

A. $2x^2 - 2x - \sqrt[3]{13824} = 0$

$2x^2 - 2x - 24 = 0$

$2x^2 - 8x + 6x - 24 = 0$

$2x(x - 4) + 6(x - 4) = 0$

$(2x + 6)(x - 4) = 0$

$x = -3, 4$

B. $3x^2 + 20x + \sqrt{1024} = 0$

$3x^2 + 20x + 32 = 0$

$3x^2 + 12x + 8x + 32 = 0$

$3x(x + 4) + 8(x + 4) = 0$

$(3x + 8)(x + 4) = 0$

$x = -8/3, -4$

C. $45x^2 + 75x - 30 = 0$

$15(3x^2 + 5x - 2) = 0$

$3x^2 + 5x - 2 = 0$

$3x^2 + 6x - x - 2 = 0$

$3x(x + 2) - 1(x + 2) = 0$

$(3x - 1)(x + 2) = 0$

$x = 1/3, -2$

Now, according to the question

The sum of the square of roots of equation A = $(-3)^2 + (4)^2 = 9 + 16 = 25$

The sum of the square of roots of equation C = $(1/3)^2 + (-2)^2 = 1/9 + 4 = (1 + 36)/4 = 37/4$

Required difference = $25 - 37/4 = (100 - 37)/4 = 63/4 = 15.75$

Q:2 The correct answer is **Option 2** i.e. **325/9.**

A. $2x^2 - 2x - \sqrt[3]{13824} = 0$

$2x^2 - 2x - 24 = 0$

$2x^2 - 8x + 6x - 24 = 0$

$2x(x - 4) + 6(x - 4) = 0$

$(2x + 6)(x - 4) = 0$

$x = -3, 4$

B. $3x^2 + 20x + \sqrt{1024} = 0$

$3x^2 + 20x + 32 = 0$

$3x^2 + 12x + 8x + 32 = 0$

$3x(x + 4) + 8(x + 4) = 0$

$(3x + 8)(x + 4) = 0$

$x = -8/3, -4$

C. $45x^2 + 75x - 30 = 0$

$15(3x^2 + 5x - 2) = 0$

$3x^2 + 5x - 2 = 0$

$3x^2 + 6x - x - 2 = 0$

$3x(x + 2) - 1(x + 2) = 0$

$(3x - 1)(x + 2) = 0$

$x = 1/3, -2$

Now, according to the question

The sum of the square of all negative roots = $(-3)^2 + (-8/3)^2 + (-4)^2 + (-2)^2$

$9 + 64/9 + 16 + 4$

$(81 + 64 + 144 + 36)/9 = 325/9$

Q:3 The correct answer is **Option 4** i.e. **13.**

A. $2x^2 - 2x - \sqrt[3]{13824} = 0$

$2x^2 - 2x - 24 = 0$

$2x^2 - 8x + 6x - 24 = 0$

$2x(x - 4) + 6(x - 4) = 0$

$(2x + 6)(x - 4) = 0$

$x = -3, 4$

B. $3x^2 + 20x + \sqrt{1024} = 0$

$3x^2 + 20x + 32 = 0$

$3x^2 + 12x + 8x + 32 = 0$

$3x(x + 4) + 8(x + 4) = 0$

$(3x + 8)(x + 4) = 0$

$x = -8/3, -4$

C. $45x^2 + 75x - 30 = 0$

$15(3x^2 + 5x - 2) = 0$

$3x^2 + 5x - 2 = 0$

$3x^2 + 6x - x - 2 = 0$

$3x(x + 2) - 1(x + 2) = 0$

$(3x - 1)(x + 2) = 0$

$x = 1/3, -2$

Now, according to the question

The sum of all positive roots = $4 + 1/3 = 13/3$

$3 \times 13/3 = 13$

Q:4 The correct answer is **Option 1** i.e. **5 : 12 : 20.**

The standard form of the equation is $a - b + c = 0$ and,

b will be in the form of $b_1/a, b_2/a$

Thus, from the given roots i.e. 1/4 and 3/5 quadratic equation will be

$20x^2 - 17x + 3$ [you can recheck its roots by solving this quadratic equation]

Now, according to the question

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This quadratic equation will be divided by 4 and $0.25x - 1.75$ then, the newly formed quadratic equation will be

$5x^2 - 4x - 1 = 0$

$5x^2 - 5x + x - 1 = 0$

$5x(x - 1) + (x - 1) = 0$

$(5x + 1)(x - 1) = 0$

$x = -1/5, 1$

Now, all positive roots are $1/4$, $3/5$ and 1

Hence, the ratio $= 1/4 : 3/5 : 1 = 5 : 12 : 20$

Q:5 The correct answer is **Option 3** i.e. **26/25**.

The standard form of the equation is $a - b + c = 0$ and,

b will be in the form of b_1/a, b_2/a

Thus, from the given roots i.e. $1/4$ and $3/5$ quadratic equation will be

$20x^2 - 17x + 3$ [you can recheck its roots by solving this quadratic equation]

Now, according to the question

This quadratic equation will be divided by 4 and $0.25x - 1.75$ then, the newly formed quadratic equation will be

$5x^2 - 4x - 1 = 0$

$5x^2 - 5x + x - 1 = 0$

$5x(x - 1) + (x - 1) = 0$

$(5x + 1)(x - 1) = 0$

$x = -1/5, 1$

Now, the sum of the square of the quadratic roots of the newly formed quadratic equation

$(-1/5)^2 + (1)^2 = 1/25 + 1 = 26/25$

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