**1. Write two quadratic equations such that the sum of roots equals twice the**

**product of roots?**

Ans: Here are two quadratic equations that satisfy the given condition:

**1. Equation 1: \(x^2 - (2k)x + k = 0\)**

**2. Equation 2: \(x^2 - (2m)x + m = 0\)**

In both equations, the sum of the roots will be equal to twice the product of the roots.

Let's find the sum and product of the roots for each equation to verify:

1. Equation 1: \(x^2 - (2k)x + k = 0\)

Sum of roots: \(S\_1 = \frac{-(-2k)}{1} = 2k\)

Product of roots: \(P\_1 = \frac{k}{1} = k\)

We can observe that \(S\_1 = 2P\_1\), satisfying the given condition.

2. Equation 2: \(x^2 - (2m)x + m = 0\)

Sum of roots: \(S\_2 = \frac{-(-2m)}{1} = 2m\)

Product of roots: \(P\_2 = \frac{m}{1} = m\)

Again, we see that \(S\_2 = 2P\_2\), fulfilling the given condition.

Therefore, the two quadratic equations \(x^2 - (2k)x + k = 0\) and \(x^2 - (2m)x + m = 0\) satisfy the requirement that the sum of roots equals twice the product of roots.

1. **2x+3y=12 has (2,3) as its solution or not?**

Ans: Substituting x = 2 and y = 3:

2(2) + 3(3) = 4 + 9 = 13

Since 13 is not equal to 12, the equation does not hold true when we substitute x = 2 and y = 3. Therefore, **(2, 3) is not a solution** to the equation 2x + 3y = 12.

1. **Find possible coordinates of (x,y) such that point (1,1), (2,2) & (x,y) are collinear?**

Ans: Two points are collinear if and only if the slope between any two pairs of points is the same.

Let's calculate the slope between the given points (1, 1) and (2, 2):

Slope = (y2 - y1) / (x2 - x1)

= (2 - 1) / (2 - 1)

= 1 / 1

= 1

Now, we can use the same slope between the points (1, 1) and (x, y) to find the possible coordinates (x, y).

Slope = (y - 1) / (x - 1)

Since the slope between (1, 1) and (x, y) is 1, we can set up the equation:

(y - 1) / (x - 1) = 1

Simplifying the equation, we have:

y - 1 = x - 1

y = x

This means that any point (x, y) lying on the line y = x will be collinear with the points **(1, 1) and (2, 2).**

Therefore, the possible coordinates of (x, y) such that the points (1, 1), (2, 2), and (x, y) are collinear are all the points of the form (n, n), where n is any real number.

**4. Find out all possible values of a & b for which the ratio of a^3+b^3 to a^3-b^3 is 1:1**

**a,b are real numbers.**

Ans: To simplify the equation, let's consider a variable substitution:

Let x = a^3 and y = b^3

Now the equation becomes:

(x + y) / (x - y) = 1:1

We can cross-multiply the equation:

(x + y) = (x - y)

Expanding the equation, we have:

x + y = x - y

The variable y cancels out, and we are left with:

2y = 0

This equation implies that y = 0.

Now, substituting y = 0 back into the equation x + y = x - y, we have:

x + 0 = x - 0

x = x

This equation implies that x can be any real number.

Recall that x = a^3 and y = b^3, so a^3 can be any real number, and b^3 must be 0.

Taking the cube root of both sides, we find that a can be any real number, and b must be 0.

Therefore, the possible values for **a are all real numbers, and the possible value for b is 0.**

**5. The triangle area formed by the lines y=x, y-axis and y=3 line will be?**

Ans: The lines y = x, y-axis, and y = 3 intersect at three points: (0, 0), (3, 3), and (3, 3).

The base of the triangle is the line segment between the points (0, 0) and (3, 3), which has a length of 3 units.

To find the height of the triangle, we need to determine the perpendicular distance from the line y = 3 to the line y = x.

The line y = 3 is a horizontal line passing through y = 3 on the y-axis.

The perpendicular distance from a horizontal line to a line with a positive slope like y = x can be calculated as the difference between the y-coordinates of the two lines.

Therefore, the height of the triangle is 3 - 0 = 3 units.

Now, we can use the formula for the area of a triangle:

Area = (1/2) \* base \* height

= (1/2) \* 3 \* 3

= 4.5 square units

Hence, the area of the triangle formed by the lines y = x, the y-axis, and y = 3 is **4.5 square units.**