**Lower Elementary:**

*Question:* Vicky has 92 patterns to sew on a quilt. She sewed half of the patterns on the quilt on Saturday. She sewed half of the remaining patterns on the quilt on Sunday. How many patterns are still left to be sewn on the quilt?

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**Upper Elementary:**

*Question:* I am a three-digit odd number. My one’s digit is divisible by 3. My hundred’s digit is twice as large as the one’s digit. The ten’s digit is five less than the hundred’s digit. What number am I?

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**Middle School:**

*Question:* Laura has six less than three times the number of bracelets that Megan has. If Laura has 9 bracelets, how many bracelets does Megan have? Write an equation to solve the problem.

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**Algebra and Up:**

*Question:* Ryan’s ball has a radius 3 times as large as Carly’s ball. If Ryan’s ball has a volume of 972π cubic inches, what is the volume of Carly’s ball?

**Lower Elementary:**

*Question:* Vicky has 92 patterns to sew on a quilt. She sewed half of the patterns on the quilt on Saturday. She sewed half of the remaining patterns on the quilt on Sunday. How many patterns are still left to be sewn on the quilt?

*Answer:* 23 patterns

*Solution:* Vicky sewed half of the patterns on Saturday. Half of 92 = half of 90 + half of 2 = 45 + 1 = 46. She sewed 46 patterns on Saturday. Vicky sewed half of the remaining patterns on Sunday. Half of 46 = half of 40 + half of 6 = 20 + 3 = 23. She sewed 23 patterns on Sunday, so she has 23 patterns left to sew.

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**Upper Elementary:**

*Question:* I am a three-digit odd number. My one’s digit is divisible by 3. My hundred’s digit is twice as large as the one’s digit. The ten’s digit is five less than the hundred’s digit. What number am I?

*Answer:* 613

*Solution:* The one’s digit is divisible by 3, so the one’s digit can be 3, 6, or 9. The hundred’s digit is twice as large as the one’s digit. 3 doubled is 6, 6 doubled is 12, and 9 doubled is 18. Since 6 is the only option that is one digit, the hundred’s digit must be 6 and the one’s digit must be 3. The ten’s digit is five less than the hundred’s digit. The hundred’s digit is 6, so the ten’s place is 1. The number is 613.

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**Middle School:**

*Question:* Laura has six less than three times the number of bracelets that Megan has. If Laura has 9 bracelets, how many bracelets does Megan have? Write an equation to solve the problem.

*Answer:* L = 3M – 6, Megan has 5 bracelets

*Solution:* If we rewrite the statement as an equation, we have L = 3M – 6, where L is the number of bracelets Laura has and M is the number of bracelets that Megan has. Since Laura has 9 bracelets, our equation becomes:

9 = 3M – 6

Add 6 to both sides.

15 = 3M

Divide both sides by 3.

5 = M

Megan has 5 bracelets.

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**Algebra and Up:**

*Question:* Ryan’s ball has a radius 3 times as large as Carly’s ball. If Ryan’s ball has a volume of 972π cubic inches, what is the volume of Carly’s ball?

*Answer:* 36π cubic inches

*Solution:* The volume of a sphere is V = 4/3πr3. Ryan’s ball has a volume of 972π cubic inches, so we have 972π = 4/3πr3.

Multiply both sides by 3/4.

729π = πr3

Divide both sides by π.

729 = r3

9 to the third power is 729, so the radius of Ryan’s ball is 9 inches. Since the radius of Ryan’s ball is 3 times that of Carly’s ball, Carly’s ball has a radius of 3 inches. This means that Carly’s ball has a volume of 4/3π(3)3 = 36π cubic inches.