Note: The range is defined to be the difference of the largest element and the smallest element of a set.

Solution 2

Because 40 is less than the score of every game they've played so far, the measures of center will never rise. Only measures of spread, such as the $\boxed{\textbf{(A) range}}$, may increase.

6 In $\triangle ABC$, $AB = BC = 29$, and $AC = 42$. What is the area of $\triangle ABC$?

A. 100 B. 420 C. 500 D. 609 E. 701

Answer B

Solution **Solution 1**

We know the semi-perimeter of $\triangle ABC$ is $\frac{29+29+42}{2} = 50$. Next, we use Heron's Formula to find that the area of the triangle is just $\sqrt{50(50-29)^2(50-42)} = \sqrt{50 \cdot 21^2 \cdot 8} = \boxed{\textbf{(B) } 420}$.

Solution 2

Splitting the isosceles triangle in half, we get a right triangle with hypotenuse 29 and leg 21. Using the Pythagorean Theorem , we know the height is $\sqrt{29^2 - 21^2} = 20$. Now that we know the height, the area is $\frac{(20)(42)}{2} = \boxed{\textbf{(B) } 420}$.

7 Each of two boxes contains three chips numbered 1, 2, 3. A chip is drawn randomly from each box and the numbers on the two chips are multiplied. What is the probability that their product is even?

A. $\frac{1}{9}$ B. $\frac{2}{9}$ C. $\frac{4}{9}$ D. $\frac{1}{2}$ E. $\frac{5}{9}$

Answer E

Solution **Solution 1**

You can make this problem into a spinner problem. You have the first spinner with 3 equally divided

sections: $1, 2$, and 3. You make a second spinner that is identical to the first, with 3 equal sections of

1,2, and 3. If the first spinner lands on 1, it must land on two for the result to be even. You write down the first

combination of numbers: $(1, 2)$. Next, if the spinner lands on 2, it can land on any number on the second

spinner. We now have the combinations of $(1, 2), (2, 1), (2, 2),$ and $(2, 3)$. Finally, if the first spinner ends on 3, we

have $(3, 2)$. Since there are $3 \cdot 3 = 9$ possible combinations, and we have 5 evens, the final answer is

$\boxed{(\mathbf{E})\ \frac{5}{9}}$.

Solution 2

We can list out the numbers. Box A has chips 1, 2, and 3, and Box B also has chips 1, 2, and 3. Chip 1 (from Box A)

could be with 3 partners from Box B. This is also the same for chips 2 and 3 from Box A.

$3 + 3 + 3 = 9$ total sums. Chip 1 could be multiplied with 2 other chips to make an even product, just like chip 3. Chip 2 can only multiply with 1 chip. $2 + 2 + 1 = 5$. The answer is

$\boxed{(\mathbf{E})\ \frac{5}{9}}$.

8 What is the smallest whole number larger than the perimeter of any triangle with a side of length 5 and a side of length 19?

A. 24 B. 29 C. 43 D. 48 E. 57

Answer D