2008 AMC 8 Problems/Problem 1

Problem

Susan had 50 dollars to spend at the carnival. She spent 12 dollars on food and twice as much on rides. How many dollars did she have left to spend?

$\textbf{(A)}\ 12 \qquad \textbf{(B)}\ 14 \qquad \textbf{(C)}\ 26 \qquad \textbf{(D)}\ 38 \qquad \textbf{(E)}\ 50$

Solution

If Susan spent 12 dollars, then twice that much on rides, then she spent 36 dollars in total. We subtract 36 from 50 to get $\boxed{\textbf{(B)}\ 14}$

See Also

2008 AMC 8 (Problems • Answer Key • Resources (http://www.artofproblemsolving.com/Forum/resources.php?c=182&cid=42&year=2008))	
Preceded by First Problem	Followed by Problem 2
1 • 2 • 3 • 4 • 5 • 6 • 7 • 8 • 9 • 10 • 11 • 12 • 13 • 14 • 15 • 16 • 17 • 18 • 19 • 20 • 21 • 22 • 23 • 24 • 25	
All AJHSME/AMC 8 Problems and Solutions	

2008 AMC 8 Problems/Problem 2

Problem

The ten-letter code BEST OF LUCK represents the ten digits $0-9$, in order. What 4-digit number is represented by the code word CLUE?

$\textbf{(A)}\ 8671 \qquad \textbf{(B)}\ 8672 \qquad \textbf{(C)}\ 9781 \qquad \textbf{(D)}\ 9782 \qquad \textbf{(E)}\ 9872$

Solution

We can derive that $C=8$, $L=6$, $U=7$, and $E=1$. Therefore, the answer is $\boxed{\textbf{(A)}\ 8671}$

See Also

2008 AMC 8 (Problems • Answer Key • Resources (http://www.artofproblemsolving.com/Forum/resources.php?c=182&cid=42&year=2008))	
Preceded by Problem 1	Followed by Problem 3
1 • 2 • 3 • 4 • 5 • 6 • 7 • 8 • 9 • 10 • 11 • 12 • 13 • 14 • 15 • 16 • 17 • 18 • 19 • 20 • 21 • 22 • 23 • 24 • 25	
All AJHSME/AMC 8 Problems and Solutions	

2008 AMC 8 Problems/Problem 3

Problem

If February is a month that contains Friday the 13^{th}, what day of the week is February 1?

$\textbf{(A)}\ \text{Sunday} \qquad \textbf{(B)}\ \text{Monday} \qquad \textbf{(C)}\ \text{Wednesday} \qquad \textbf{(D)}\ \text{Thursday} \qquad \textbf{(E)}\ \text{Saturday}$

Solution

We can go backwards by days, but we can also backwards by weeks. If we go backwards by weeks, we see that February 6 is a Friday. If we now go backwards by days, February 1 is a $\boxed{\textbf{(A)}\ \text{Sunday}}$

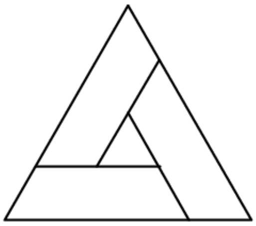
See Also

2008 AMC 8 (Problems • Answer Key • Resources (http://www.artofproblemsolving.com/Forum/resources.php?c=182&cid=42&year=2008))	
Preceded by Problem 2	Followed by Problem 4
1 • 2 • 3 • 4 • 5 • 6 • 7 • 8 • 9 • 10 • 11 • 12 • 13 • 14 • 15 • 16 • 17 • 18 • 19 • 20 • 21 • 22 • 23 • 24 • 25	
All AJHSME/AMC 8 Problems and Solutions	

2008 AMC 8 Problems/Problem 4

Problem

In the figure, the outer equilateral triangle has area 16, the inner equilateral triangle has area 1, and the three trapezoids are congruent. What is the area of one of the trapezoids?



$\textbf{(A)}\ 3 \qquad \textbf{(B)}\ 4 \qquad \textbf{(C)}\ 5 \qquad \textbf{(D)}\ 6 \qquad \textbf{(E)}\ 7$

Solution

The area outside the small triangle but inside the large triangle is $16-1=15$. This is equally distributed between the three trapezoids. Each trapezoid has an area of $15/3 = \boxed{\textbf{(C)}\ 5}$.

See Also

2008 AMC 8 (Problems • Answer Key • Resources (http://www.artofproblemsolving.com/Forum/resources.php?c=182&cid=42&year=2008))	
Preceded by Problem 3	Followed by Problem 5
1 • 2 • 3 • 4 • 5 • 6 • 7 • 8 • 9 • 10 • 11 • 12 • 13 • 14 • 15 • 16 • 17 • 18 • 19 • 20 • 21 • 22 • 23 • 24 • 25	
All AJHSME/AMC 8 Problems and Solutions	

2008 AMC 8 Problems/Problem 5

Problem

Barney Schwinn notices that the odometer on his bicycle reads 1441, a palindrome, because it reads the same forward and backward. After riding 4 more hours that day and 6 the next, he notices that the odometer shows another palindrome, 1661. What was his average speed in miles per hour?

$\textbf{(A)}\ 15 \qquad \textbf{(B)}\ 16 \qquad \textbf{(C)}\ 18 \qquad \textbf{(D)}\ 20 \qquad \textbf{(E)}\ 22$

Solution

Barney travels $1661-1441=220$ miles in $4+6=10$ hours for an average of $220/10=\boxed{\textbf{(E)}\ 22}$ miles per hour.

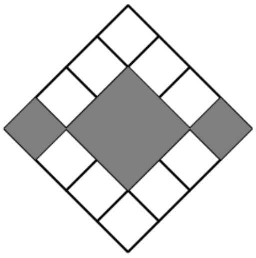
See Also

2008 AMC 8 (Problems • Answer Key • Resources (http://www.artofproblemsolving.com/Forum/resources.php?c=182&cid=42&year=2008))	
Preceded by Problem 4	Followed by Problem 6
1 • 2 • 3 • 4 • 5 • 6 • 7 • 8 • 9 • 10 • 11 • 12 • 13 • 14 • 15 • 16 • 17 • 18 • 19 • 20 • 21 • 22 • 23 • 24 • 25	
All AJHSME/AMC 8 Problems and Solutions	

2008 AMC 8 Problems/Problem 6

Problem

In the figure, what is the ratio of the area of the gray squares to the area of the white squares?



$\textbf{(A)}\ 3:10 \qquad\textbf{(B)}\ 3:8 \qquad\textbf{(C)}\ 3:7 \qquad\textbf{(D)}\ 3:5 \qquad\textbf{(E)}\ 1:1$

Solution

Dividing the gray square into four smaller squares, there are 6 gray tiles and 10 white tiles, giving a ratio of $\boxed{\textbf{(D)}\ 3:5}$.

See Also

2008 AMC 8 (Problems • Answer Key • Resources (http://www.artofproblemsolving.com/Forum/resources.php?c=182&cid=42&year=2008))	
Preceded by Problem 5	Followed by Problem 7
1 • 2 • 3 • 4 • 5 • 6 • 7 • 8 • 9 • 10 • 11 • 12 • 13 • 14 • 15 • 16 • 17 • 18 • 19 • 20 • 21 • 22 • 23 • 24 • 25	
All AJHSME/AMC 8 Problems and Solutions	

2008 AMC 8 Problems/Problem 7

Problem

If $\frac{3}{5} = \frac{M}{45} = \frac{60}{N}$, what is $M+N$?

$\textbf{(A)}\ 27\qquad\textbf{(B)}\ 29\qquad\textbf{(C)}\ 45\qquad\textbf{(D)}\ 105\qquad\textbf{(E)}\ 127$

Solution

Separate into two equations $\frac{3}{5} = \frac{M}{45}$ and $\frac{3}{5} = \frac{60}{N}$ and solve for the unknowns. $M=27$ and $N=100$, therefore $M+N = \boxed{\textbf{(E)}\ 127}$.

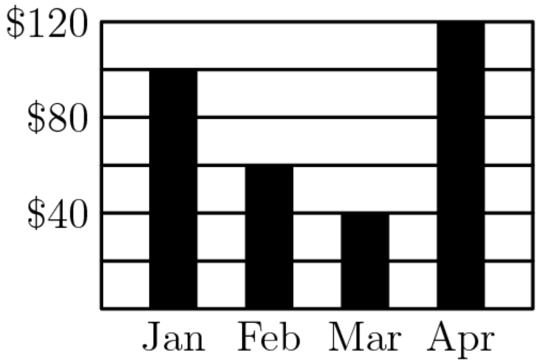
See Also

2008 AMC 8 (Problems • Answer Key • Resources (http://www.artofproblemsolving.com/Forum/resources.php?c=182&cid=42&year=2008))	
Preceded by Problem 6	Followed by Problem 8
1 • 2 • 3 • 4 • 5 • 6 • 7 • 8 • 9 • 10 • 11 • 12 • 13 • 14 • 15 • 16 • 17 • 18 • 19 • 20 • 21 • 22 • 23 • 24 • 25	
All AJHSME/AMC 8 Problems and Solutions	

2008 AMC 8 Problems/Problem 8

Problem

Candy sales from the Boosters Club from January through April are shown. What were the average sales per month in dollars?



$\textbf{(A)}\ 60 \qquad \textbf{(B)}\ 70 \qquad \textbf{(C)}\ 75 \qquad \textbf{(D)}\ 80 \qquad \textbf{(E)}\ 85$

Solution

There are a total of $100+60+40+120=320$ dollars of sales spread through 4 months, for an average of $320/4=\boxed{\textbf{(D)}\ 80}$.

See Also

2008 AMC 8 (Problems • Answer Key • Resources (http://www.artofproblemsolving.com/Forum/resources.php?c=182&cid=42&year=2008))	
Preceded by Problem 7	Followed by Problem 9
1 • 2 • 3 • 4 • 5 • 6 • 7 • 8 • 9 • 10 • 11 • 12 • 13 • 14 • 15 • 16 • 17 • 18 • 19 • 20 • 21 • 22 • 23 • 24 • 25	
All AJHSME/AMC 8 Problems and Solutions	

2008 AMC 8 Problems/Problem 9

Problem

In 2005 Tycoon Tammy invested 100 dollars for two years. During the the first year her investment suffered a 15% loss, but during the second year the remaining investment showed a 20% gain. Over the two-year period, what was the change in Tammy's investment?

$\textbf{(A)}\ 5\%\text{ loss}\qquad\textbf{(B)}\ 2\%\text{ loss}\qquad\textbf{(C)}\ 1\%\text{ gain}\qquad\textbf{(D)}\ 2\%\text{ gain}\qquad\textbf{(E)}\ 5\%\text{ gain}$

Solution

After the 15% loss, Tammy has $100 \cdot 0.85 = 85$ dollars. After the 20% gain, she has $85 \cdot 1.2 = 102$ dollars. This is an increase in 2 dollars from her original 100 dollars, a $\boxed{\textbf{(D)}\ 2\%\text{ gain}}$.

See Also

2008 AMC 8 (Problems • Answer Key • Resources (http://www.artofproblemsolving.com/Forum/resources.php?c=182&cid=42&year=2008))	
Preceded by Problem 8	Followed by Problem 10
1 • 2 • 3 • 4 • 5 • 6 • 7 • 8 • 9 • 10 • 11 • 12 • 13 • 14 • 15 • 16 • 17 • 18 • 19 • 20 • 21 • 22 • 23 • 24 • 25	
All AJHSME/AMC 8 Problems and Solutions	

2008 AMC 8 Problems/Problem 10

Problem

The average age of the 6 people in Room A is 40. The average age of the 4 people in Room B is 25. If the two groups are combined, what is the average age of all the people?

$\textbf{(A)}\ 32.5 \qquad \textbf{(B)}\ 33 \qquad \textbf{(C)}\ 33.5 \qquad \textbf{(D)}\ 34 \qquad \textbf{(E)}\ 35$

Solution

The total of all their ages over the number of people is

$$\frac{6\cdot 40+4\cdot 25}{6+4} = \frac{340}{10} = \boxed{\textbf{(D)}\ 34}$$

See Also

2008 AMC 8 (Problems • Answer Key • Resources (http://www.artofproblemsolving.com/Forum/resources.php?c=182&cid=42&year=2008))	
Preceded by Problem 9	Followed by Problem 11
1 • 2 • 3 • 4 • 5 • 6 • 7 • 8 • 9 • 10 • 11 • 12 • 13 • 14 • 15 • 16 • 17 • 18 • 19 • 20 • 21 • 22 • 23 • 24 • 25	
All AJHSME/AMC 8 Problems and Solutions	

2008 AMC 8 Problems/Problem 11

Problem

Each of the 39 students in the eighth grade at Lincoln Middle School has one dog or one cat or both a dog and a cat. Twenty students have a dog and 26 students have a cat. How many students have both a dog and a cat?

$\textbf{(A)}\ 7 \qquad \textbf{(B)}\ 13 \qquad \textbf{(C)}\ 19 \qquad \textbf{(D)}\ 39 \qquad \textbf{(E)}\ 46$

Solution

The union of two sets is equal to the sum of each set minus their intersection. The number of students that have both a dog and a cat is $20+26-39 = \boxed{\textbf{(A)}\ 7}$.

See Also

2008 AMC 8 (Problems • Answer Key • Resources (http://www.artofproblemsolving.com/Forum/resources.php?c=182&cid=42&year=2008))	
Preceded by Problem 10	Followed by Problem 12
1 • 2 • 3 • 4 • 5 • 6 • 7 • 8 • 9 • 10 • 11 • 12 • 13 • 14 • 15 • 16 • 17 • 18 • 19 • 20 • 21 • 22 • 23 • 24 • 25	
All AJHSME/AMC 8 Problems and Solutions	

2008 AMC 8 Problems/Problem 12

Problem

A ball is dropped from a height of 3 meters. On its first bounce it rises to a height of 2 meters. It keeps falling and bouncing to $\frac{2}{3}$ of the height it reached in the previous bounce. On which bounce will it not rise to a height of 0.5 meters?

$\textbf{(A)}\ 3 \qquad \textbf{(B)}\ 4 \qquad \textbf{(C)}\ 5 \qquad \textbf{(D)}\ 6 \qquad \textbf{(E)}\ 7$

Solution

Each bounce is $2/3$ times the height of the previous bounce. The first bounce reaches 2 meters, the second $4/3$, the third $8/9$, the fourth $16/27$, and the fifth $32/81$. Half of 81 is 40.5, so the ball does not reach the required height on bounce $\boxed{\textbf{(C)}\ 5}$.

See Also

2008 AMC 8 (Problems • Answer Key • Resources (http://www.artofproblemsolving.com/Forum/resources.php?c=182&cid=42&year=2008))	
Preceded by Problem 11	Followed by Problem 13
1 • 2 • 3 • 4 • 5 • 6 • 7 • 8 • 9 • 10 • 11 • 12 • 13 • 14 • 15 • 16 • 17 • 18 • 19 • 20 • 21 • 22 • 23 • 24 • 25	
All AJHSME/AMC 8 Problems and Solutions	

2008 AMC 8 Problems/Problem 13

Problem

Mr. Harman needs to know the combined weight in pounds of three boxes he wants to mail. However, the only available scale is not accurate for weights less than 100 pounds or more than 150 pounds. So the boxes are weighed in pairs in every possible way. The results are 122, 125 and 127 pounds. What is the combined weight in pounds of the three boxes?

$\textbf{(A)}\ 160 \qquad \textbf{(B)}\ 170 \qquad \textbf{(C)}\ 187 \qquad \textbf{(D)}\ 195 \qquad \textbf{(E)}\ 354$

Solution

Each box is weighed twice during this, so the combined weight of the three boxes is half the weight of these separate measures

$$\frac{122+125+127}{2} = \frac{374}{2} = \boxed{\textbf{(C)}\ 187}$$

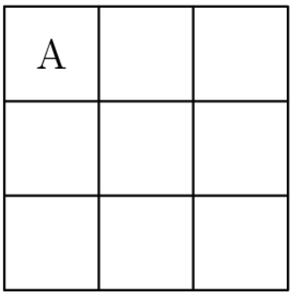
See Also

2008 AMC 8 (Problems • Answer Key • Resources (http://www.artofproblemsolving.com/Forum/resources.php?c=182&cid=42&year=2008))	
Preceded by Problem 12	Followed by Problem 14
1 • 2 • 3 • 4 • 5 • 6 • 7 • 8 • 9 • 10 • 11 • 12 • 13 • 14 • 15 • 16 • 17 • 18 • 19 • 20 • 21 • 22 • 23 • 24 • 25	
All AJHSME/AMC 8 Problems and Solutions	

2008 AMC 8 Problems/Problem 14

Problem

Three A's, three B's, and three C's are placed in the nine spaces so that each row and column contain one of each letter. If A is placed in the upper left corner, how many arrangements are possible?



$\textbf{(A)}\ 2\qquad\textbf{(B)}\ 3\qquad\textbf{(C)}\ 4\qquad\textbf{(D)}\ 5\qquad\textbf{(E)}\ 6$

Solution

There are 2 ways to place the remaining A's, 2 ways to place the remaining B's, and 1 way to place the remaining C's for a total of $(2)(2)(1) = \boxed{\textbf{(C)}\ 4}$.

See Also

2008 AMC 8 (Problems • Answer Key • Resources (http://www.artofproblemsolving.com/Forum/resources.php?c=182&cid=42&year=2008))	
Preceded by Problem 13	Followed by Problem 15
1 • 2 • 3 • 4 • 5 • 6 • 7 • 8 • 9 • 10 • 11 • 12 • 13 • 14 • 15 • 16 • 17 • 18 • 19 • 20 • 21 • 22 • 23 • 24 • 25	
All AJHSME/AMC 8 Problems and Solutions	

2008 AMC 8 Problems/Problem 15

Problem

In Theresa's first 8 basketball games, she scored $7, 4, 3, 6, 8, 3, 1$ and 5 points. In her ninth game, she scored fewer than 10 points and her points-per-game average for the nine games was an integer. Similarly in her tenth game, she scored fewer than 10 points and her points-per-game average for the 10 games was also an integer. What is the product of the number of points she scored in the ninth and tenth games?

$\textbf{(A)}\ 35 \qquad \textbf{(B)}\ 40 \qquad \textbf{(C)}\ 48 \qquad \textbf{(D)}\ 56 \qquad \textbf{(E)}\ 72$

Solution

The total number of points from the first 8 games is $7+4+3+6+8+3+1+5=37$. To make this a multiple of 9 by scoring less than 10 points, Theresa must score 8 points to have a total of 45 points. To make a multiple of 10, she must score 5 points. The product of these two numbers of points is $8\cdot5=\boxed{\textbf{(B)}\ 40}$.

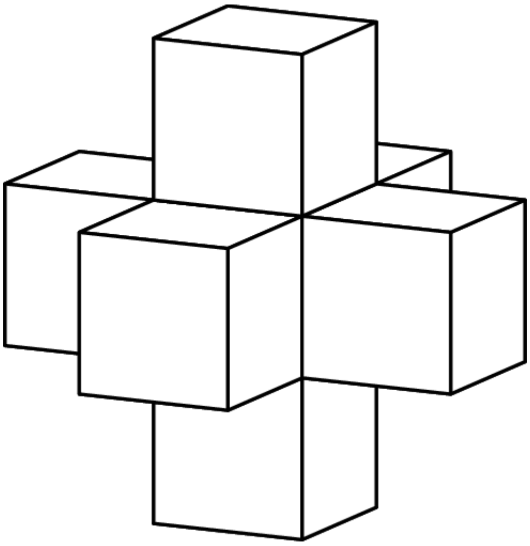
See Also

2008 AMC 8 (Problems • Answer Key • Resources (http://www.artofproblemsolving.com/Forum/resources.php?c=182&cid=42&year=2008))	
Preceded by Problem 14	Followed by Problem 16
1 • 2 • 3 • 4 • 5 • 6 • 7 • 8 • 9 • 10 • 11 • 12 • 13 • 14 • 15 • 16 • 17 • 18 • 19 • 20 • 21 • 22 • 23 • 24 • 25	
All AJHSME/AMC 8 Problems and Solutions	

2008 AMC 8 Problems/Problem 16

Problem

A shape is created by joining seven unit cubes, as shown. What is the ratio of the volume in cubic units to the surface area in square units?



$\textbf{(A)}\ 1 : 6 \qquad\textbf{(B)}\ 7 : 36 \qquad\textbf{(C)}\ 1 : 5 \qquad\textbf{(D)}\ 7 : 30 \qquad\textbf{(E)}\ 6 : 25$

Solution

The volume is of seven unit cubes which is 7. The surface area is the same for each of the protruding cubes which is $5 \cdot 6 = 30$. The ratio of the volume to the surface area is $\boxed{\textbf{(D)}\ 7 : 30}$.

See Also

2008 AMC 8 (Problems • Answer Key • Resources (http://www.artofproblemsolving.com/Forum/resources.php?c=182&cid=42&year=2008))	
Preceded by Problem 15	Followed by Problem 17
1 • 2 • 3 • 4 • 5 • 6 • 7 • 8 • 9 • 10 • 11 • 12 • 13 • 14 • 15 • 16 • 17 • 18 • 19 • 20 • 21 • 22 • 23 • 24 • 25	
All AJHSME/AMC 8 Problems and Solutions	

2008 AMC 8 Problems/Problem 17

Problem

Ms.Osborne asks each student in her class to draw a rectangle with integer side lengths and a perimeter of 50 units. All of her students calculate the area of the rectangle they draw. What is the difference between the largest and smallest possible areas of the rectangles?

$\textbf{(A)}\ 76\qquad\textbf{(B)}\ 120\qquad\textbf{(C)}\ 128\qquad\textbf{(D)}\ 132\qquad\textbf{(E)}\ 136$

Solution

A rectangle's area is maximized when it is shaped like a square, or the two side lengths are closest together in this case with integer lengths. This occurs with the sides $12\times 13 = 156$. Likewise, the area is smallest when the side lengths have the greatest difference, which is $1\times 24 = 24$. The difference in area is $156-24 = \boxed{\textbf{(D)}\ 132}$.

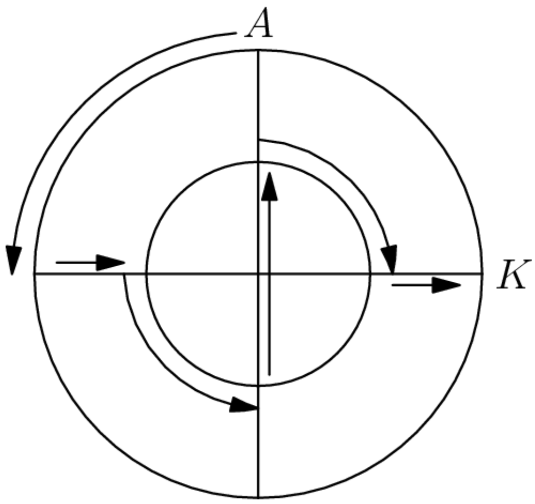
See Also

2008 AMC 8 (Problems • Answer Key • Resources (http://www.artofproblemsolving.com/Forum/resources.php?c=182&cid=42&year=2008))	
Preceded by Problem 16	Followed by Problem 18
1 • 2 • 3 • 4 • 5 • 6 • 7 • 8 • 9 • 10 • 11 • 12 • 13 • 14 • 15 • 16 • 17 • 18 • 19 • 20 • 21 • 22 • 23 • 24 • 25	
All AJHSME/AMC 8 Problems and Solutions	

2008 AMC 8 Problems/Problem 18

Problem

Two circles that share the same center have radii 10 meters and 20 meters. An aardvark runs along the path shown, starting at A and ending at K. How many meters does the aardvark run?



$\textbf{(A)}\ 10\pi+20\qquad\textbf{(B)}\ 10\pi+30\qquad\textbf{(C)}\ 10\pi+40\qquad\textbf{(D)}\ 20\pi+20\qquad$
$\textbf{(E)}\ 20\pi+40$

Solution

We will deal with this part by part: Part 1: 1/4 circumference of big circle= $\frac{2\pi r}{4}=\frac{\pi r}{2}=\frac{20\pi}{2}=10\pi$ Part 2: Big radius minus small radius= $20-10=10$ Part 3: 1/4 circumference of small circle= $\frac{\pi r}{2}=\frac{10\pi}{2}=5\pi$ Part 4: Diameter of small circle: $2*10=20$ Part 5: Same as part 3: 5π Part 6: Same as part 2: 10 Total: $10\pi+10+5\pi+20+5\pi+10=\boxed{E=20\pi+40}$

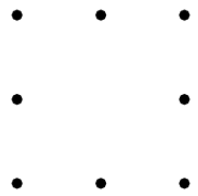
See Also

2008 AMC 8 (Problems • Answer Key • Resources (http://www.artofproblemsolving.com/Forum/resources.php?c=182&cid=42&year=2008))	
Preceded by Problem 17	Followed by Problem 19
1 • 2 • 3 • 4 • 5 • 6 • 7 • 8 • 9 • 10 • 11 • 12 • 13 • 14 • 15 • 16 • 17 • 18 • 19 • 20 • 21 • 22 • 23 • 24 • 25	
All AJHSME/AMC 8 Problems and Solutions	

2008 AMC 8 Problems/Problem 19

Problem

Eight points are spaced around at intervals of one unit around a 2×2 square, as shown. Two of the 8 points are chosen at random. What is the probability that the two points are one unit apart?



$\textbf{(A)}\ \frac{1}{4}\qquad\textbf{(B)}\ \frac{2}{7}\qquad\textbf{(C)}\ \frac{4}{11}\qquad\textbf{(D)}\ \frac{1}{2}\qquad\textbf{(E)}\ \frac{4}{7}$

Solution

The two points are one unit apart at 8 places around the edge of the square. There are ${}_8C_2 = 28$ ways to choose two points. The probability is

$$\frac{8}{28} = \boxed{\textbf{(B)}\ \frac{2}{7}}$$

See Also

2008 AMC 8 (Problems • Answer Key • Resources (http://www.artofproblemsolving.com/Forum/resources.php?c=182&cid=42&year=2008))	
Preceded by Problem 21	Followed by Problem 20
1 • 2 • 3 • 4 • 5 • 6 • 7 • 8 • 9 • 10 • 11 • 12 • 13 • 14 • 15 • 16 • 17 • 18 • 19 • 20 • 21 • 22 • 23 • 24 • 25	
All AJHSME/AMC 8 Problems and Solutions	

2008 AMC 8 Problems/Problem 20

Problem

The students in Mr. Neatkin's class took a penmanship test. Two-thirds of the boys and $\frac{3}{4}$ of the girls passed the test, and an equal number of boys and girls passed the test. What is the minimum possible number of students in the class?

$\textbf{(A)}\ 12 \qquad \textbf{(B)}\ 17 \qquad \textbf{(C)}\ 24 \qquad \textbf{(D)}\ 27 \qquad \textbf{(E)}\ 36$

Solution

Let b be the number of boys and g be the number of girls.

$$\frac{2}{3}b = \frac{3}{4}g \Rightarrow b = \frac{9}{8}g$$

For g and b to be integers, g must cancel out with the numerator, and the smallest possible value is 8. This yields 9 boys. The minimum number of students is $8+9=\boxed{\textbf{(B)}\ 17}$.

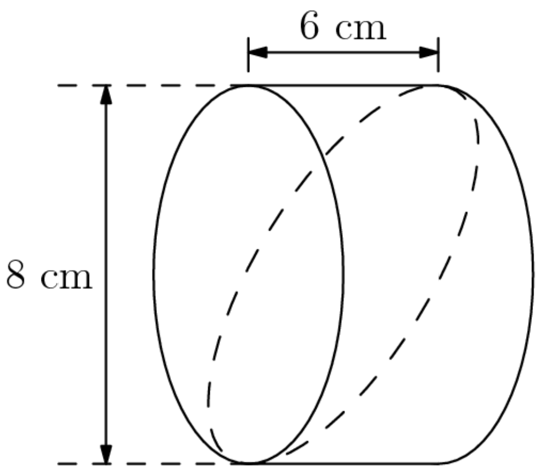
See Also

2008 AMC 8 (Problems • Answer Key • Resources (http://www.artofproblemsolving.com/Forum/resources.php?c=182&cid=42&year=2008))	
Preceded by Problem 19	Followed by Problem 21
1 • 2 • 3 • 4 • 5 • 6 • 7 • 8 • 9 • 10 • 11 • 12 • 13 • 14 • 15 • 16 • 17 • 18 • 19 • 20 • 21 • 22 • 23 • 24 • 25	
All AJHSME/AMC 8 Problems and Solutions	

2008 AMC 8 Problems/Problem 21

Problem

Jerry cuts a wedge from a 6-cm cylinder of bologna as shown by the dashed curve. Which answer choice is closest to the volume of his wedge in cubic centimeters?



$\textbf{(A)}\ 48 \qquad \textbf{(B)}\ 75 \qquad \textbf{(C)}\ 151 \qquad \textbf{(D)}\ 192 \qquad \textbf{(E)}\ 603$

Solution

The slice is cutting the cylinder into two equal wedges with equal area. The cylinder's volume is $\pi r^2 h = \pi(4^2)(6) = 96\pi$. The area of the wedge is half this which is $48\pi \approx \boxed{\textbf{(C)}\ 151}$.

See Also

2008 AMC 8 (Problems • Answer Key • Resources (http://www.artofproblemsolving.com/Forum/resources.php?c=182&cid=42&year=2008))	
Preceded by Problem 20	Followed by Problem 22
1 • 2 • 3 • 4 • 5 • 6 • 7 • 8 • 9 • 10 • 11 • 12 • 13 • 14 • 15 • 16 • 17 • 18 • 19 • 20 • 21 • 22 • 23 • 24 • 25	
All AJHSME/AMC 8 Problems and Solutions	

2008 AMC 8 Problems/Problem 22

Problem

For how many positive integer values of n are both $\frac{n}{3}$ and $3n$ three-digit whole numbers?

$\textbf{(A)}\ 12\qquad \textbf{(B)}\ 21\qquad \textbf{(C)}\ 27\qquad \textbf{(D)}\ 33\qquad \textbf{(E)}\ 34$

Solution

If $\frac{n}{3}$ is a three digit whole number, n must be divisible by 3 and be $\geq 100*3=300$. If $3n$ is three digits, n must be $\leq \frac{999}{3}=333$ So it must be divisible by three and between 300 and 333. There are $\boxed{\textbf{(A)}\ 12}$ such numbers, which you can find by direct counting.

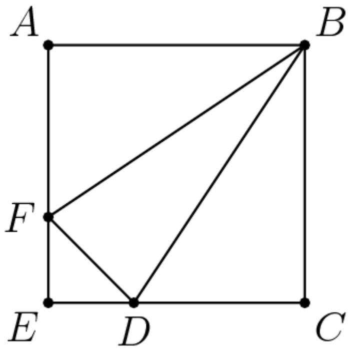
See Also

2008 AMC 8 (Problems • Answer Key • Resources (http://www.artofproblemsolving.com/Forum/resources.php?c=182&cid=42&year=2008))	
Preceded by Problem 21	Followed by Problem 23
1 • 2 • 3 • 4 • 5 • 6 • 7 • 8 • 9 • 10 • 11 • 12 • 13 • 14 • 15 • 16 • 17 • 18 • 19 • 20 • 21 • 22 • 23 • 24 • 25	
All AJHSME/AMC 8 Problems and Solutions	

2008 AMC 8 Problems/Problem 23

Problem

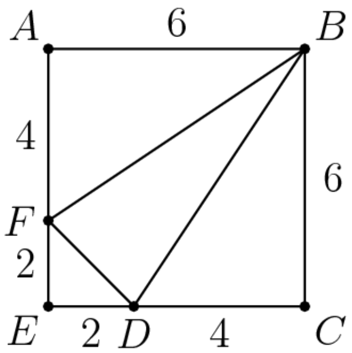
In square $ABCE$, $AF = 2FE$ and $CD = 2DE$. What is the ratio of the area of $\triangle BFD$ to the area of square $ABCE$?



$\textbf{(A)}\ \frac{1}{6} \qquad \textbf{(B)}\ \frac{2}{9} \qquad \textbf{(C)}\ \frac{5}{18} \qquad \textbf{(D)}\ \frac{1}{3} \qquad \textbf{(E)}\ \frac{7}{20}$

Solution

The area of $\triangle BFD$ is the area of square $ABCE$ subtracted by the the area of the three triangles around it. Arbitrarily assign the side length of the square to be 6.



The ratio of the area of $\triangle BFD$ to the area of $ABCE$ is

$$\frac{36-12-12-2}{36} = \frac{10}{36} = \boxed{\textbf{(C)}\ \frac{5}{18}}$$

See Also

2008 AMC 8 (Problems • Answer Key • Resources (http://www.artofproblemsolving.com/Forum/resources.php?c=182&cid=42&year=2008))	
Preceded by Problem 22	Followed by Problem 24
1 • 2 • 3 • 4 • 5 • 6 • 7 • 8 • 9 • 10 • 11 • 12 • 13 • 14 • 15 • 16 • 17 • 18 • 19 • 20 • 21 • 22 • 23 • 24 • 25	
All AJHSME/AMC 8 Problems and Solutions	

2008 AMC 8 Problems/Problem 24

Problem

Ten tiles numbered 1 through 10 are turned face down. One tile is turned up at random, and a die is rolled. What is the probability that the product of the numbers on the tile and the die will be a square?

$\textbf{(A)}\ \frac{1}{10} \qquad \textbf{(B)}\ \frac{1}{6} \qquad \textbf{(C)}\ \frac{11}{60} \qquad \textbf{(D)}\ \frac{1}{5} \qquad \textbf{(E)}\ \frac{7}{30}$

Solution

The numbers can at most multiply to be 60. The squares less than 60 are $1, 4, 9, 16, 25, 36,$ and 49. The possible pairs are $(1,1), (1,4), (2,2), (4,1), (3,3), (9,1), (4,4), (8,2), (5,5), (6,6),$ and $(9,4)$. There are 11 choices and 60 possibilities giving a probability of $\boxed{\textbf{(C)}\ \frac{11}{60}}$.

See Also

2008 AMC 8 (Problems • Answer Key • Resources (http://www.artofproblemsolving.com/Forum/resources.php?c=182&cid=42&year=2008))	
Preceded by Problem 23	Followed by Problem 25
1 • 2 • 3 • 4 • 5 • 6 • 7 • 8 • 9 • 10 • 11 • 12 • 13 • 14 • 15 • 16 • 17 • 18 • 19 • 20 • 21 • 22 • 23 • 24 • 25	
All AJHSME/AMC 8 Problems and Solutions	

2008 AMC 8 Problems/Problem 25

Problem

Margie's winning art design is shown. The smallest circle has radius 2 inches, with each successive circle's radius increasing by 2 inches. Approximately what percent of the design is black?

$\textbf{(A)}\ 42\qquad\textbf{(B)}\ 44\qquad\textbf{(C)}\ 45\qquad\textbf{(D)}\ 46\qquad\textbf{(E)}\ 48$

Solution

circle #	radius	area
1	2	4π
2	4	16π
3	6	36π
4	8	64π
5	10	100π
6	12	144π

The entire circle's area is 144π. The area of the black regions is $(100-64)\pi+(36-16)\pi+4\pi=60\pi$. The percentage of the design that is black is $\dfrac{60\pi}{144\pi}=\dfrac{5}{12}\approx\boxed{\textbf{(A)}\ 42}$.

See Also

2008 AMC 8 (Problems • Answer Key • Resources (http://www.artofproblemsolving.com/Forum/resources.php?c=182&cid=42&year=2008))	
Preceded by Problem 24	Followed by Last Problem
1 • 2 • 3 • 4 • 5 • 6 • 7 • 8 • 9 • 10 • 11 • 12 • 13 • 14 • 15 • 16 • 17 • 18 • 19 • 20 • 21 • 22 • 23 • 24 • 25	
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