XVI. AMC 8 Practice Questions
10-01

At Euclid Middle School the mathematics teachers are Miss Germain, Mr. Newton, and Mrs. Young. There are 11 students in Miss Germain's class, 8 students in Mr. Newton's class, and 9 students in Mrs. Young's class taking the AMC 8 Contest this year. How many mathematics students at Euclid Middle School are taking the contest?

(A) 26 **(B)** 27 **(C)** 28 **(D)** 29 **(E)** 30

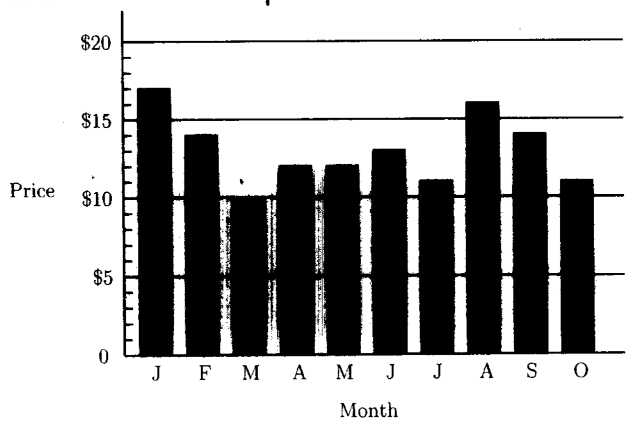
2010 AMC 8, Problem #1—
"How many students in each class?"

Solution

Answer (C): The total number of students taking the test is $11 + 8 + 9 = 28$.

Difficulty: Easy
CCSS-M: 6.NS.3 Fluently add, subtract, multiply an divide multi-digit decimals using the standard algorithm for each operation.

The graph shows the price of five gallons of gasoline during the first ten months of the year. By what percent is the highest price more than the lowest price?



(A) 50 **(B)** 62 **(C)** 70 **(D)** 89 **(E)** 100

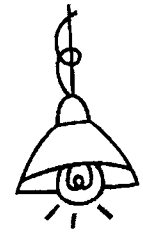
2010 AMC 8, Problem #3—
"Read the heights on the bar chart carefully."

Solution

Answer (C): The highest price in January was $17 and the lowest in March was $10. The $17 price was $7 more than the $10 price, and 7 is 70% of 10.

Difficulty: Medium Easy
CCSS-M: 6.SP.4. Display numerical data in plots on a number line, including dot plots, histograms, and box plots.

Alice needs to replace a light bulb located 10 centimeters below the ceiling in her kitchen. The ceiling is 2.4 meters above the floor. Alice is 1.5 meters tall and can reach 46 centimeters above the top of her head. Standing on a stool, she can just reach the light bulb. What is the height of the stool, in centimeters?



(A) 32 **(B)** 34 **(C)** 36 **(D)** 38 **(E)** 40

2010 AMC 8, Problem #5—
"How far above Alice's head is the ceiling?"

Solution

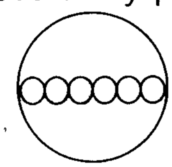
Answer (B): The ceiling is $2.4 - 1.5 = 0.9$ meters $= 90$ centimeters above Alice's head. She can reach 46 centimeters above the top of her head, and the light bulb is 10 centimeters below the ceiling, so the stool is $90 - 46 - 10 = 34$ centimeters high.

Difficulty: Medium Easy
CCSS-M: 7.NS.1 Represent addition and subtraction on a horizontal or vertical line diagram.

AMC 8 Practice Questions Continued

10-10

Six pepperoni circles will exactly fit across the diameter of a 12-inch pizza when placed as shown. If a total of 24 circles of pepperoni are placed on this pizza without overlap, what fraction of the pizza is covered by pepperoni?



(A) $\frac{1}{2}$ **(B)** $\frac{2}{3}$ **(C)** $\frac{3}{4}$ **(D)** $\frac{5}{6}$ **(E)** $\frac{7}{8}$

2010 AMC 8, Problem #10—
"What's the diameter of each pepperoni slice?"

Solution

Answer (B): If six pepperonis fit across the diameter, then each pepperoni circle has a diameter of 2 inches and a radius of 1 inch. The area of each pepperoni is $\pi(1)^2 = \pi$ square inches. The 24 pepperoni circles cover 24π square inches of the pizza. The area of the pizza is $\pi(6)^2 = 36\pi$ square inches. The fraction of the pizza covered by pepperoni is $\frac{24\pi}{36\pi} = \frac{2}{3}$.

Difficulty: Medium Hard
CCSS-M: 7.G.4. Know the formulas for the area and circumference of a circle and use them to solve problems.

A square and a circle have the same area. What is the ratio of the side length of the square to the radius of the circle?

(A) $\frac{\sqrt{\pi}}{2}$ **(B)** $\sqrt{\pi}$ **(C)** π **(D)** 2π **(E)** π^2

2010 AMC 8, Problem #16— "What's the area of the circle?"

Solution

Answer (B): Let the radius of the circle be 1. Then the area of the circle is $\pi(1)^2 = \pi$. The area of the square is π, so its side length $\sqrt{\pi}$. The ratio of the side length of the square to the radius of the circle is $\frac{\sqrt{\pi}}{1} = \sqrt{\pi}$.
Note: The "squaring of a circle" is a classical problem. In the latter part of the 19th century it was proven that a square having an area equal to that of a given circle cannot be constructed with the standard tools of straightedge and compasss because it is impossible to construct a transcendental number, e. g. $\sqrt{\pi}$.

Difficulty: Hard
CCSS-M: 7.G.4. Know the formulas for the area and circumference of a circle and use them to solve problems.