


1. If it takes 10 minutes to saw a log into 3 pieces, how long does it take to saw it into 4 pieces?
- 12 minutes
 - $13\frac{1}{3}$ minutes
 - 14 minutes
 - 15 minutes
 - 16 minutes

2. The temperature of a chemical is dropping d degrees per minute. At 8:00 pm, the temperature was 0° C. What was the temperature in degrees centigrade m minutes before 8:00 pm?


- $d + m$
- $d - m$
- $(d/m)(m)$
- $-dm$
- dm

3. Which statement is true?

- The solution of $\frac{2}{3}x - \frac{4}{5} = \frac{3}{8}x + \frac{5}{7}$ is less than the solution of $\frac{2}{3}y - \frac{4}{5} = \frac{3}{8}y + \frac{5}{7}$.
- The solution of $3x + 9 = 27$ is equal to the solution of $x + 6 = 24$.
- The solution of $4(x - 3) = 36$ is greater than the solution of $x - 3 = 9$.
- The solution of $\frac{1}{x} = 8$ is less than the solution of $8x = 1$.
- The solution of $\frac{2x}{6} = 15$ is equal to the solution of $\frac{x}{3} = 15$


4. 


If the fraction strip shown here represents $\frac{2}{3}$, which fraction strip represents $\frac{3}{2}$?

- a. 

- b. 

- c. 

- d. 

- e. 

5. In water (H_2O), the ratio of the weight of oxygen to the weight of hydrogen is approximately 8:1. How many ounces of hydrogen are in 1 lb of water?
- $1\frac{7}{9}$
 - 2
 - $1\frac{8}{9}$
 - $2\frac{1}{9}$
 - $1\frac{1}{8}$
6. In base four, one counts 1, 2, 3, 10, 11, 12, 13, 20, 21, 22, 23, 30, 31, 32, 33, 100, etc. What is the base ten equivalent of the base four number 123?
- 19
 - 27
 - 36
 - 60
 - 228
7. Mrs. Smith was hired at a yearly salary of \$30,000. She received a raise of 3% after the first year and then a raise of 2% after the second year. What percent of her original salary is her salary after two years (rounded to the nearest 0.01%)?
- 95.18%
 - 96.96%
 - 98.04%
 - 102.03%
 - 105.06%
8. Select the statement which is **not** always true, assuming x and y are non-zero real numbers.
- $|-x + -y| = |x + y|$
 - $|x^2| = x^2$
 - $\frac{1}{x} < x$
 - $|x - y| \geq x - y$
 - $|x^3| = x^2|x|$

9. Which of the following numbers is the least?

a. $\left(-\frac{1}{8}\right)^{\frac{2}{3}}$

b. $\left(\frac{1}{8}\right)^{-\frac{2}{3}}$

c. $\left(\frac{1}{8}\right)^{-\frac{4}{3}}$

d. $\left(-\frac{1}{8}\right)^{-\frac{2}{3}}$

e. $(-8)^{-\frac{4}{3}}$

10. $\frac{-\sqrt{15}}{1-\sqrt{300}}$ is equivalent to

a. $\frac{1}{-1+2\sqrt{5}}$

b. $\frac{1}{1+2\sqrt{5}}$

c. $\frac{\sqrt{15}(1-10\sqrt{3})}{299}$

d. $\frac{\sqrt{15}(1+10\sqrt{3})}{-299}$

e. $\frac{\sqrt{15}(1+10\sqrt{3})}{299}$

11. Bread A has 1 g of fiber and 4 g of protein per slice, while Bread B has 2 g of fiber and 3 g of protein per slice. After Tom ate some slices of each type of bread, he calculated that there were 16 g of fiber and 39 g of protein in the bread he ate. What is the total number of slices of bread Tom ate?

a. 9

b. 10

c. 11

d. 12

e. 13

12. One stamp is randomly selected from a 10x10 sheet of stamps. What is the probability that the stamp is not on the border?
- 0.36
 - 0.40
 - 0.60
 - 0.64
 - 0.50
13. Which of the following statements is false?
- There is a greatest negative integer.
 - Between any two rational numbers, there is another rational number.
 - Between any two irrational numbers, there is another irrational number.
 - There is a least non-negative rational number.
 - There is a greatest negative rational number.
14. What is the product of $1.2_{\text{base five}}$ and $0.3_{\text{base five}}$. Give the answer in base five.
- 0.134
 - 2.0
 - 0.41
 - 0.36
 - 0.311
15. If $g(x) = 3x + 1$ and $f(x) = x^2$, what is the value of $g(f(-4)) - f(g(-4))$
- 96
 - 96
 - 72
 - 72
 - 3
16. Eighty people are trapped in a ski lodge. They have enough food to last eight days. It takes five days to reach help (and five days for help to get back to the lodge). What is the fewest number of people to send for help (with sufficient food) so that those staying behind will be rescued before food runs out?
- 16
 - 18
 - 20
 - 24
 - 32

17. Steve rotates the tires on his car every 6,000 miles. When the car was new, it had 5 tires; one was used as a spare. When he rotated the tires the left front went to the right back; the right back went to the trunk to be the spare; the spare went to the left back; the left back went to the right front; and the right front tire went to the left front. How many miles of wear does the tire that was in the original left front position have after car is driven 50,000 miles?
- 6,000 miles
 - 8,000 miles
 - 38,000 miles
 - 44,000 miles
 - 50,000 miles
18. Paul paid \$54 for a coat. He had an employee discount that allowed him to take 25% off the sale price. The sale price was 40% off the original price. What was the original price of the coat?
- \$154.50
 - \$120
 - \$112.50
 - \$105
 - \$94.50
19. A pencil and a magazine cost \$4.25. A magazine and a notebook cost \$6.50. A notebook and a pencil cost \$5.75. How much does the pencil cost?
- \$1.25
 - \$1.75
 - \$2.00
 - \$2.25
 - \$2.50
20. A manufacturer made 111 ounces of cologne. The company puts $\frac{5}{8}$ ounce of cologne in each bottle. After filling as many bottles as possible, how many ounces of cologne will be left over?
- $\frac{3}{5}$ ounce
 - $\frac{2}{5}$ ounce
 - $\frac{3}{8}$ ounce
 - $\frac{1}{40}$ ounce
 - 0 ounce

21. Adult tickets for a game cost \$7. Student tickets for the same game cost \$4. The ratio of adult tickets to student tickets sold was 1:3. If the value of all the tickets sold was \$1,368, how many tickets were sold altogether?

- a. 92
- b. 144
- c. 216
- d. 288
- e. 420

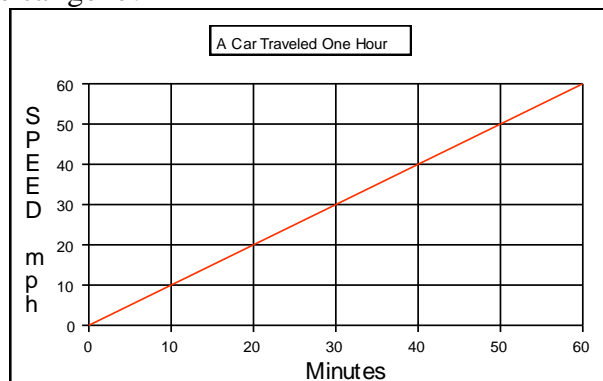
22. Beth can paint a house in 5 hours. Tim can paint half of the same house in 75 minutes. How long would it take both of them working together to paint the house?

- a. 1 hour, 67 minutes
- b. 2 hours, 15 min
- c. 1 hour, 40 min
- d. 3 hours
- e. 7 hours, 30 minutes

23. How many integers are there between 6×10^{98} and 5×10^{100} (not counting 6×10^{98} and 5×10^{100})?

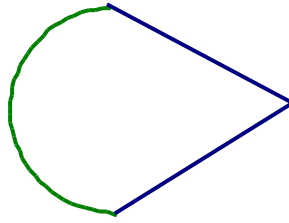
- a. $4.94 \times 10^{100} - 1$
- b. $4.94 \times 10^{99} - 1$
- c. $4.94 \times 10^{98} - 1$
- d. 494
- e. 493

24. The graph below shows the speed, in miles per hour, of a car for one hour. At the end of the hour, how far had the car gone?



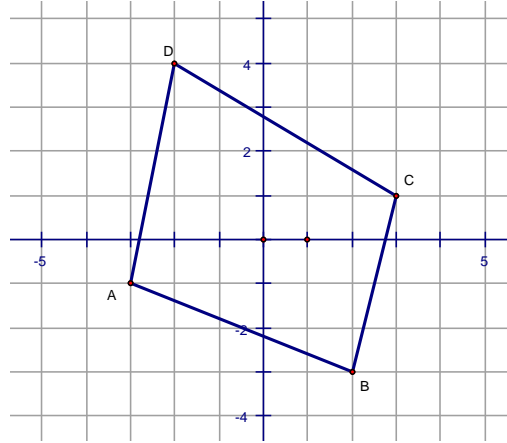
- a. 10 miles
- b. 15 miles
- c. 30 miles
- d. 60 miles
- e. 360 miles

25. The arc in the figure shown here is a semi-circle. The segments are congruent to each other and form a 60° angle. The perimeter of the entire figure is $5\pi + 20$ units. What is the diameter of the circle?

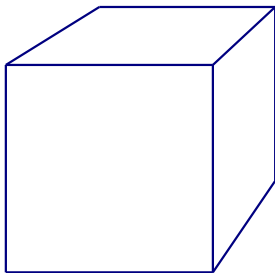


- a. 5 units
b. 10 units
c. 5π units
d. 10π units
e. $\frac{10}{\pi}$ units
26. The odometer of a car showed 43,842.7 miles when the car got to a sign that said “Detour 1500 feet ahead.” What will the odometer say when the car reaches the detour? (There are 5,280 feet in a mile.)
- a. The odometer will read 43,992.7.
b. The odometer will read 45,342.7.
c. The odometer will read 43,857.7.
d. The odometer will read 43,842.9.
e. The odometer will read 43,844.2.
27. At 210 miles per hour, how long would it take a race car to complete a 1.4 mile lap at the race track?
- a. 24 seconds
b. 28 seconds
c. 34 seconds
d. 40 seconds
e. 48 seconds
28. If $xy = 48$ and $x^2 + y^2 = 1026.25$, then what is the value of $(x + y)^2$?
- a. 1026.25
b. 1074.25
c. 1122.25
d. 3330.25
e. 49,260

29. A quadrilateral is shown on the graph below. Suppose that a new quadrilateral, $A'B'C'D'$ were defined by multiplying each component of the coordinates of $ABCD$ by -2 . (For example, the coordinates of A' would be $(6,2)$.) Which statement would be true?



- The area of $A'B'C'D'$ would be 4 times that of $ABCD$.
 - The area of $A'B'C'D'$ would be -4 times that of $ABCD$.
 - The area of $A'B'C'D'$ would be 2 times that of $ABCD$.
 - The area of $A'B'C'D'$ would be -2 times that of $ABCD$.
 - The area of $ABCD$ would equal to that of $A'B'C'D'$.
30. A cube that is 6 inches on each edge is cut into two congruent prisms along a diagonal as shown here.



Which statement gives the best approximation of the change in the total surface area of the two resulting prisms compared to the original cube?

- The total surface area of the two new prisms is about 0.7 square feet greater than the surface area of the original cube.
- The total surface area of the two new prisms is about 0.35 square feet greater than the surface area of the original cube.
- The total surface area of the two new prisms is about 1 square foot greater than the surface area of the original cube.
- The total surface area of the two new prisms is equal to the surface area of the original cube.
- The total surface area of the two new prisms is about 101 square feet greater than the surface area of the original cube.