

Copyright 2009 Daniel Eiblum
Copied from: *Math SAT 800: How to Master the Toughest Problems*
Visit www.amazon.com for copies.

CHAPTER 1

ASSESSMENT EXAM

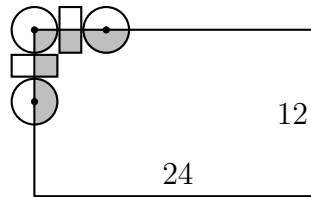
1. A small square is removed from a large square, reducing the area of the large square by 4%. How many times longer is the side of the large square than the side of the small square?
 - A. $\frac{2\sqrt{6}}{5}$
 - B. $\sqrt{5}$
 - C. 3
 - D. 5
 - E. $5\sqrt{2}$
2. A triangle in the xy -plane has corners $(-3, 0)$, $(0, 3)$, and $(3, 0)$. The line $y = \frac{1}{3}x + 1$ separates the triangle into two pieces. What is the area of the piece lying below the line?
 - A. 3
 - B. $\frac{10}{3}$
 - C. $\frac{7}{3}$
 - D. $\frac{9}{2}$
 - E. 4
3. A bowling ball with a radius of 6 inches is rolled forward in a straight line and comes to a stop after traveling 32 feet. A foot is equal to 12 inches. How many *full* revolutions did the bowling ball make?(Ignore any incomplete revolutions it made).
 - A. 9
 - B. 10
 - C. 11
 - D. 12
 - E. 13
4. A car salesman wants to display 5 cars in a line in front of the showroom window. He has two SUVs, two sedans, and one sports car. The only stipulation is that he does NOT want to put the SUVs on either end of the line. How many possible arrangements of cars will he have?
 - A. 48
 - B. 36

- C. 24
D. 12
E. 9
5. Jack says he has two coins in his hand, each of a different value (out of either pennies, nickels, dimes, or quarters). Lisa also has two coins of a different value. What is the probability that, putting their money together, they can afford a pack of gum for 50 cents?
- A. $\frac{11}{36}$
B. $\frac{5}{18}$
C. $\frac{1}{4}$
D. $\frac{4}{18}$
E. $\frac{7}{36}$
6. Nine contestants are entered into a competition. The top four contestants with the most points will win medals for first place, second place, third place, and fourth place, respectively. How many ways can the medals be awarded among the nine contestants?
- A. 6561
B. 3024
C. 1024
D. 361
E. 36
7. An ice cream store has 12 different ice cream flavors and 5 different toppings to choose from. If a child has a choice of any two flavors of ice cream and any one topping, how many possible combinations are available to her, assuming that she will choose two different flavors of ice cream?
- A. 60
B. 120
C. 330
D. 660
E. 720
8. What is the remainder of dividing 23425 by 18?
- A. 4
B. 7
C. 10
D. 13
E. 16

9. A number whose units digit is 7 is raised to some positive integer power. Which of the following is definitely FALSE?
- The units digit of the result is 1
 - The units digit of the result is 3
 - The units digit of the result is 6
 - The units digit of the result is 7
 - The units digit of the result is 9
10. A solution contains s grams of salt for each w grams of water. If one wants to use r less grams of water, how much less salt should be added to the solution so that the correct ratio of salt to water be preserved?
- $\frac{sr}{w}$
 - $\frac{rw}{s}$
 - $\frac{s}{rw}$
 - $\frac{w}{rs}$
 - $\frac{ws}{r}$
11. The ratio of the area of circle A with radius r to the circumference of circle B with radius r' is c . What is the ratio of the area of circle A to that of circle B ?
- $\frac{c}{2r'}$
 - $\frac{2c}{r'}$
 - $\frac{2r'}{c}$
 - $\frac{r'}{2c}$
 - $\frac{c}{r'}$
12. x is a 2-digit positive integer. When its digits are reversed, the result is a 2-digit positive integer equal to $2x + 2$. What is the product of the digits of x ?
- 10
 - 52
 - 54
 - 63
 - 72
13. The following multiplication is performed; which is a possible value for the digit N ?

$$\begin{array}{r} J \ K \ L \ M \\ \times \quad 4 \ 2 \\ \hline 4 \ 0 \ 3 \ N \end{array}$$

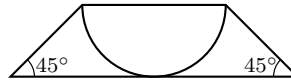
- A. 0
 B. 2
 C. 4
 D. 6
 E. All of the above
14. The diagram below depicts a large rectangle whose perimeter is being covered by alternating circles and small rectangles. The circles each have radius 2 and the small rectangles are each 2×4 . When the large rectangle's perimeter is completely covered, what will be the total area of the shaded regions—the areas inside the small shapes that are also inside the large rectangle?



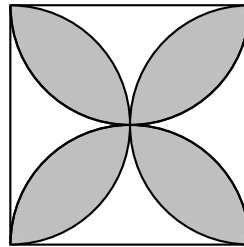
Note: Figure not drawn to scale.

- A. $48 + 20\pi$
 B. $12 + 20\pi$
 C. 44π
 D. $18 + 10\pi$
 E. $36 + 10\pi$
15. If you can buy A apples for C cents, how many dollars does it cost to buy X apples?
- A. $\frac{CX}{100A}$
 B. ACX
 C. $\frac{CA}{X}$
 D. $\frac{100CA}{X}$
 E. $\frac{AX}{100C}$
16. A crew of 20 people takes 200 days to build 2 houses. How long will it take a crew of 10 people to build 3 houses? (Assume that they all work at the same speed).
- A. 200 days
 B. 300 days
 C. 600 days
 D. 750 days
 E. 1200 days

17. A semicircle sits inside a trapezoid as shown. What proportion of the trapezoid's area is occupied by the semicircle?



- A. $\frac{\pi}{4}$
B. $\frac{3\pi}{16}$
C. $\frac{\pi}{8}$
D. $\frac{\pi}{6}$
E. $\frac{2\pi}{9}$
18. The area of the square is 36. All four semicircles are the same size and all four intersect at the center of the square. What is the area of the shaded region?



- A. $72 - 18\pi$
B. 3π
C. 9π
D. $36 - 9\pi$
E. $18\pi - 36$