

EM3 (Elementary Math)

Diagnostic Test

Rules

- This diagnostic test consists of questions from all chapters of the course. If the student scores at least 90% in this test, then the student can skip this course. Signup for the next course.
- If the student scored less than 90% of this test, then you should join this course.
- The student should try to answer all of the questions without a calculator and without any help. No time limit and no negative scoring.
- Each question carries 1 point. Total number of answers are 26. You should score at least 24 out of 26 to score 90% or above.
- Answers are provided at end of test. Print this test if possible but keep the answer sheet away until end of test.

Find LCM for the following pair of numbers.

1 35

14

LCM =

2 9

15

LCM =

Simplify the below to mixed fractions

3 $\frac{11}{10} = \underline{\quad} \underline{\quad}$

4 $\frac{23}{7} = \underline{\quad} \underline{\quad}$

5 $\frac{10}{9} = \underline{\quad} \underline{\quad}$

6 $\frac{30}{8} = \underline{\quad} \underline{\quad}$

7 A sandwich and a glass of milk cost a total of \$5. The sandwich costs \$2 more than the glass of milk. What is the price of each item?

glass of milk costs \$

sandwich costs \$

8 A pizza and a salad cost a total of \$18. The pizza costs 5 times as much as the salad. What is the price of each item?

pizza costs \$

salad costs \$

9 The cost of an apple and a banana is \$1. The cost of an apple and a pear is 90¢. The cost of a banana and a pear is 70¢. What is the price of each item?

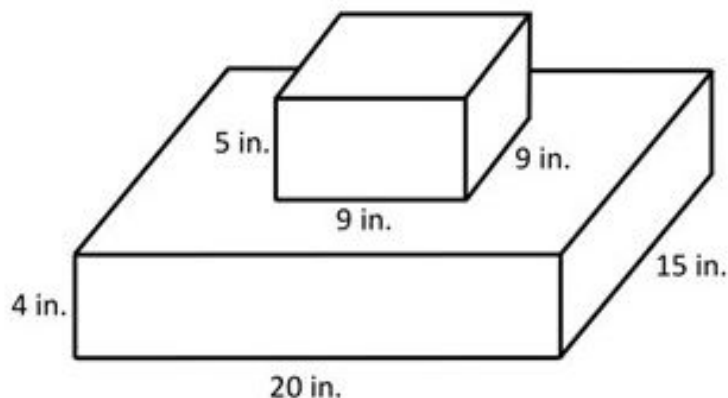
apple costs ¢

banana costs ¢

pear costs ¢

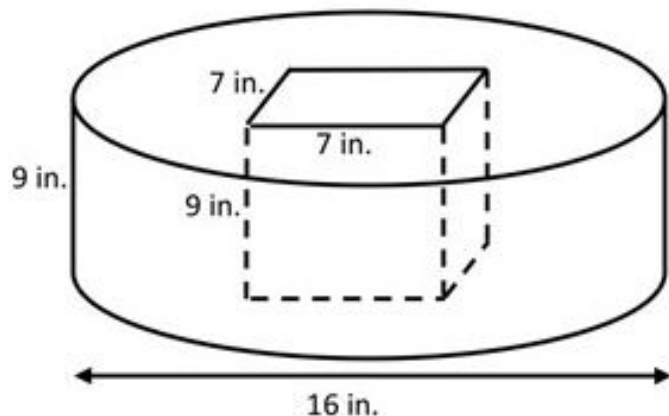
Below are cakes that need icing spread on every square inch of their exposed surfaces (not on the bottom or between layers). Calculate the number of square inches on the cakes that need icing. If needed, round final answer to nearest whole number.

- 10** The two-layer cake has a smaller layer resting upon a larger layer.



in.²

- 11** The 16-inch diameter cylindrical cake has a square hole that goes all the way to the bottom. Note: the sides of the cake formed by the hole also need to be iced.



in.²

12) How many numbers less than 100 and divisible by 3 are also divisible by 4? _____

- A) 96
- B) 42
- C) 8
- D) 25
- E) 33

13) If 10 % of 20 % of 40 % of a number is 4, find the number ? _____

14) Which number is greater ?

- A) 65%
- B) $\frac{5}{8}$

- 15 Five lamps are arranged in a row as shown in the figure below. Each lamp has its own switch. All five lamps *A*, *B*, *C*, *D*, and *E* are now off. Ben starts to turn each switch from *A* to *E* and he repeats the pattern (always from *A* to *E* in order) until he turns the switches 126 times. Which lamps are on in the end? (Write the answer in Alphabetical order)



- 16 What is the difference between the sum of the first 100 even counting numbers and the sum of the first 100 odd counting numbers?

17 How many odd perfect square factors does $2^4 \times 3^6 \times 5^{10} \times 7^9$ have? _____

- A) 24
- B) 60
- C) 120
- D) 385
- E) 3850

18 How many positive integral factors does $2^8 \times 3^4 \times 7^6 \times 11$ have? _____

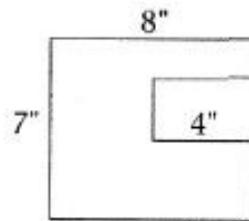
- A) 192
- B) 630
- C) 63
- D) 540
- E) 504

19 Find the number of even factors of 14014. _____

- A) 18
- B) 12
- C) 6
- D) 4
- E) 2

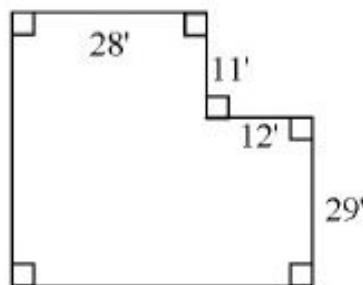
20 How many inches are in the perimeter of the following figure? All angles shown are right angles.

- A) 38 B) 32 C) 3 D) 48 E) 24

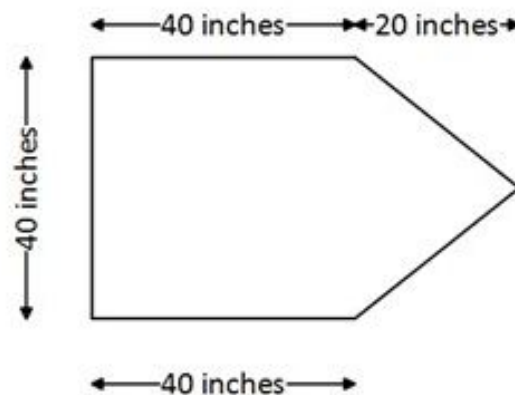


21 How many square feet are there in the house with the dimensions shown in the figure?

- A) 1468 B) 1600 C) 900 D) 1000 E) 1100



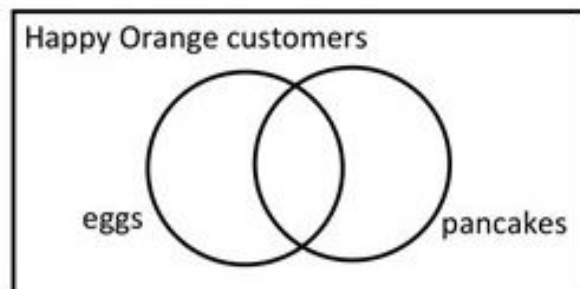
22 What is the area of the following figure? _____ inches



Complete the Venn diagrams to solve the problem.

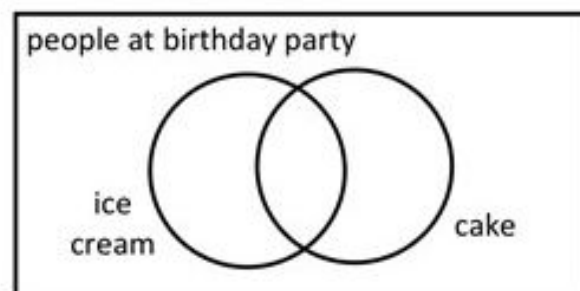
- 23** The Happy Orange Breakfast Nook has 60 customers on a Sunday morning. 20 eat only eggs. 15 eat eggs and pancakes. 17 eat neither eggs nor pancakes. How many eat only pancakes? How many eat pancakes?

people eat only pancakes
people eat pancakes



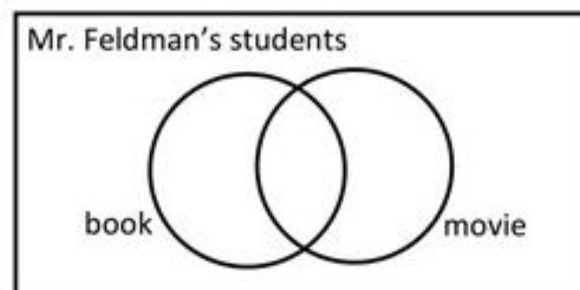
- 24** A birthday party has 45 people. 7 eat only ice cream and 14 eat only cake. 6 eat neither ice cream nor cake. How many people eat ice cream? How many people eat cake?

people eat ice cream,
people eat cake



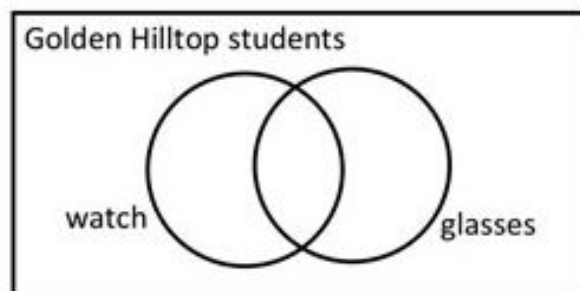
- 25** Mr. Feldman has 50 students. Over the long weekend 25 of his students see a movie, 20 of his students read a book, and 13 of his students do neither. How many of Mr. Feldman's students read a book and see a movie?

students read a book and see a movie



- 26** There are 240 students at Golden Hilltop Middle School. 78 students wear watches, 46 students wear glasses, and 12 students wear both a watch and glasses. How many students wear neither?

students wear neither



Answer Keys

1. 70
2. 45
3. $1 \frac{1}{10}$
4. $3 \frac{2}{7}$
5. $1 \frac{1}{9}$
6. $3 \frac{3}{4}$
7. Milk \$1.50

sandwich \$3.50

1. Pizza \$15, salad \$3
2. Apple 60 cents
Banana 40 cents
Pear 30 cents

1. 760 sq in
2. 856 sq in
3. 8
4. 500
5. A
6. B,C,D,E
7. 100

8. C

9. B

10. B

11. A

21. A

22. 2000 sq inches

23. 8,23

24. 25,32

25. 8

26. 128