

Middle School Math Contest Level I - Spring 2022

1. What is the area of a square if one-third its side-length is 4 units?
A) 12 units squared
B) 16 units squared
C) 48 units squared
D) 144 units squared
E) None of the above.
2. What is the least possible sum of two integers whose product is 12?
A) -13
B) -11
C) 7
D) 8
E) None of the above.
3. If one-third of the eggs in each carton of 1-dozen eggs are cracked, I must buy ? cartons to get 16-dozen eggs that are not cracked.
A) 48
B) 36
C) 24
D) 20
E) None of the above.
4. Pens come in packs of 3, 6, 8, and 12. I bought 12 packs and got a total of 121 pens. If I bought at least one of each size pack, how many packs of 8 pens did I buy?
A) 1
B) 2
C) 3
D) 4
E) None of the above.
5. The $\sqrt{4 \cdot 9 \cdot 16} =$ _____.
A) 9
B) 24
C) 29
D) 36
E) None of the above.
6. Mr. Barry is angry. He has 4 grubs left after he tried to divide 256 grubs equally among his cubs. There could be ? cubs.
A) 5
B) 6
C) 8
D) 11
E) None of the above.

7. Three times a certain number is 36. One-third of that certain number is:
- A) 4
 - B) 12
 - C) 36
 - D) 108
 - E) None of the above.
8. I collect 20 seashells every 30 minutes, but I drop 3 shells every 2 hours. If I collect shells for 8 hours, I will end up with ? shells
- A) 68
 - B) 136
 - C) 296
 - D) 308
 - E) None of the above.
9. A metallurgist has an alloy with 8% titanium and an alloy with 26% titanium. He needs 100 grams of an alloy with 17% titanium. How much of each alloy should be mixed to attain the 100 grams of alloy with 17% titanium?
- A) 50g of 8%, 50g of 26%
 - B) 60g of 8%, 40g of 26%
 - C) 55g of 8%, 45g of 26%
 - D) 45g of 8%, 55g of 26%
 - E) None of the above
10. A baker cuts circular cookies out of a flat rectangle of cookie dough. If the rectangle is 2 m by 1 m, and the cookies have radius 10 cm, at most how many cookies can the baker cut from the sheet of dough?
- A) 50
 - B) 63
 - C) 64
 - D) 200
 - E. None of the above
11. Car A left city X, traveling at an average velocity of 50 miles per hour. Two hours later, Car B left City X, traveling on the same road at an average velocity of 70 miles per hour. When will the Car B catch up to the Car A? How far will each car have traveled?
- A) 5 hrs. ; 350 mi.
 - B) 7 hrs. ; 490 mi.
 - C) 2 hrs. ; 140 mi.
 - D) 10 hrs. ; 700 mi.
 - E) None of the above

12. A famous theory in economics developed by John Maynard Keynes states that consumption expenditures are a linear function of disposable income. An economist wishes to develop a model that relates income and consumption and obtains the following information. In 2000, disposable income was \$7192 billion and consumption expenditures were \$6733 billion. In 2006, disposable income was \$9529 billion and consumption expenditures were \$9266 billion. Find the linear equation that best approximates the relation between personal consumption expenditures, $C(x)$, to disposable income, x , treating disposable income as the independent variable.
- A) $C(x) = 1084.1x - 1.1062$
 - B) $C(x) = 1.1x - 10.99$
 - C) $C(x) = 1.084x - 1062.18$
 - D) $C(x) = 1.965x + 1165.99$
 - E) None of the above
13. A waiter earns \$2.50 per hour plus an average tip of \$5 per table served. How many tables must he serve to earn more than \$60 for a 4-hour shift?
- A) About 9
 - B) At least 10 tables
 - C) At least 11 tables
 - D) About 19 tables
 - E) None of the above
14. Last year a large trucking company delivered about 2.4 million loads of goods at an average value of \$30,000 per load. What was the total value of goods delivered? Express your answer in scientific notation.
- A) $\$8 * 10^3$
 - B) $\$7.2 * 10^9$
 - C) $\$72 * 10^3$
 - D) $\$7.2 * 10^{10}$
 - E) None of the above
15. A brick staircase has a total of 18 steps. The bottom step requires 133 bricks. Each successive step requires 5 less bricks than the prior one. How many bricks are required to build the staircase?
- A) 2484 bricks
 - B) 1620 bricks
 - C) 2304 bricks
 - D) 1629 bricks
 - E) None of the above
16. Simplify i^{-65} .
- A) i
 - B) $\frac{1}{i}$
 - C) -1
 - D) $-i$
 - E) None of the above
17. Horace can dust the bookshelves in 20 minutes. It takes Stanley 15 minutes to do the same job. Find the time it takes Horace and Stanley to do the job together.
- A) $8 \frac{4}{7}$ minutes
 - B) $17 \frac{1}{2}$ minutes
 - C) 35 minutes
 - D) 10 minutes

- E) None of the above
18. If the degree measures of the angles of a triangle are in a 4:5:6 ratio, what is the difference between the measures of the largest and the smallest angles?
- A) 12°
B) 24°
C) 30°
D) 36°
E) None of the above
19. The population of a town started at 1000, then went up 10%, then down 20%, then back up 10%. The population of the town ended at:
- A) 968
B) 972
C) 1000
D) 1024
E) None of the above
20. In my orchard, there are 60 more apples than oranges, and 5 times as many apples as oranges. How many apples are there?
- A) 50
B) 75
C) 100
D) 125
E) None of the above

Answers:

1. D
2. A
3. C
4. B
5. B
6. B
7. A
8. D
9. A
10. A
11. A
12. C
13. C
14. D
15. D
16. D
17. A
18. B
19. A
20. B