

1. If you traveled 3 miles in 5 hours, then on average how much of an hour did it take to travel 1 mile?
- $\frac{3}{5}$ of an hour
 - 15 hours
 - 3 hours
 - 8 hours
 - $\frac{5}{3}$ of an hour
2. If you traveled at a constant speed of 3 miles per hour for 5 hours, then how far did you travel in 4 hours?
- 15 miles
 - 12 miles
 - 3 miles
 - 4 miles
 - 6 miles
3. If a quantity increases by 400%, by what percent would the new quantity need to decrease to get back to the original?
- 400%
 - 100%
 - 20%
 - 80%
 - 25%
4. Simplify the rational expression: $\frac{\frac{1}{2} - \frac{1}{3}}{\frac{1}{5} - \frac{1}{4}}$
- $\frac{-10}{3}$
 - $\frac{10}{3}$
 - $\frac{-3}{10}$
 - $\frac{50}{27}$
 - 1

5. What is the 100th number in the sequence 1024, 512, 256, 128, 64, 32.... ?

- a) $\frac{1}{2^{88}}$
- b) $\frac{1}{2^{89}}$
- c) $\frac{1}{2^{90}}$
- d) $\frac{1}{2^{99}}$
- e) $\frac{1}{2^{100}}$

6. Abby and Amy are playing with two fair number cubes with faces numbered 1 through 6. The possible sums of the numbers when rolling the two cubes are two through twelve. Amy claims that the probability of rolling any one of these sums with the two cubes is $\frac{1}{11}$. Which statement best describes Amy's claim?

- a) Amy is correct.
- b) Amy is incorrect because there are 10 possible sums instead of 11, so the probability is $\frac{1}{10}$.
- c) Amy is in incorrect because there are two ways to roll any sum and so the probability is $\frac{2}{11}$.
- d) Amy is incorrect because the probability of each sum is $\frac{36}{396}$.
- e) Amy is incorrect because some sums have a higher probability of occurring than others.

7. Considering all values of a and b for which $a + b$ is at most 9, a is at least 2, and b is at least -2 , what is the minimum value of $b - a$?

- a) 0
- b) -7
- c) -11
- d) -13
- e) -15

8. You purchase a lawn mower that originally costs \$500. The lawn mower is on sale for 20% off of the original price. When you check out, 10% sales tax is added on after the sale price. How much do you pay?

- a) \$110
- b) \$360
- c) \$540
- d) \$460
- e) \$440

9. Laura conducted a survey of the music preferences of forty of her classmates. The results are shown in the table below.

Type of Music	Number of Students
Country	10
Pop	12
Rock	10
Rap	5
Oldies	3

What is the probability, to the nearest percent, that a student randomly selected from those surveyed will prefer Country or Rap music?

- a) 15%
- b) 25%
- c) 38%
- d) 50%
- e) 35%

10. John can mow Mr. Dow's lawn in 45 minutes. John's cousin takes twice as long to mow the same lawn as John. How long will it take for them to mow Mr. Dow's lawn if each has a mower and they work together?

- a) 15 minutes
- b) 22.5 minutes
- c) 30 minutes
- d) 32.5 minutes
- e) 35 minutes

11. When $\frac{1}{113}$ is written as a decimal, which of the following will be true?

- a) The decimal will terminate.
- b) The decimal will not terminate but will repeat a sequence of digits.
- c) The decimal will not terminate and will not repeat a sequence of digits.
- d) $\frac{1}{113}$ cannot be written as a decimal.
- e) It is impossible to know without the use of a calculator.

12. In a game, Sarah is tossing a penny, nickel, dime, and quarter. What is the probability that she will get more heads than tails?

- a) $\frac{1}{3}$
- b) $\frac{1}{2}$
- c) $\frac{5}{8}$
- d) $\frac{5}{16}$
- e) $\frac{7}{16}$

13. There are 8 teams in a league. Each team plays every other team three times. How many games are played in all?

- a) 336
- b) 168
- c) 128
- d) 84
- e) 56

14. For which of the following tables of data is B directly proportional to A ?

i.

A	B
2	3
4	6
6	9
8	12
10	15
12	18

ii.

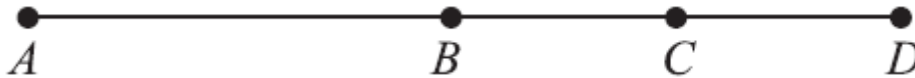
A	B
1	$\frac{3}{5}$
2	$\frac{6}{5}$
3	$\frac{9}{5}$
4	$\frac{12}{5}$
5	3
6	$\frac{18}{5}$

iii.

A	B
0	1
1	2
2	3
3	4
4	5
5	6

- a) i, ii, and iii
- b) i and ii only
- c) i and iii only
- d) i only
- e) ii only

15. Points B and C lie on segment AD as shown below. The length of segment AD is 25 units; segment AC is 19 units long; and segment BD is 14 units long. How many units long, if it can be determined, is the segment BC ?



- a) 8
- b) 5
- c) 6
- d) 11
- e) Cannot be determined from the given information.

16. Mr. Wilk is a high school math teacher whose salary is \$33,660 for this school year, which has 180 days. In Mr. Wilk's school district, substitute teachers are paid \$85 per day. If Mr. Wilk takes a day off without pay and a substitute teacher is paid to teach his classes, how much less does the school district pay in salary by paying a substitute teacher instead of Mr. Wilk for that day?

- a) \$57
- b) \$85
- c) \$102
- d) \$114
- e) \$187

17. There are 3 red, 6 blue, 5 yellow, and 4 green hair bands in a bag. Jessica wants a blue hair band and a yellow hair band to wear with her school uniform. Suppose Jessica draws a hair band at random from the bag, and then draws a second hair band at random from the bag without replacing the first. What is the probability Jessica picks a yellow hair band followed by a blue hair band?

a) $\frac{5}{54}$

b) $\frac{5}{51}$

c) $\frac{1}{2}$

d) $\frac{11}{18}$

e) $\frac{7}{18}$

18. The minimum fine for driving in excess of the speed limit is \$25. An additional \$6 is added to the minimum fine for each mile per hour (mph) in excess of the speed limit. Rachel was issued a \$103 fine for speeding in a 55-mph speed limit zone. For driving at what speed, in mph, was Rachel fined?

a) 48

b) 52

c) 62

d) 68

e) 78

19. Suppose the edges of a cube are tripled in length to produce a new, larger cube. How many times larger is the surface area of the larger cube than the surface area of the smaller cube?

a) 3

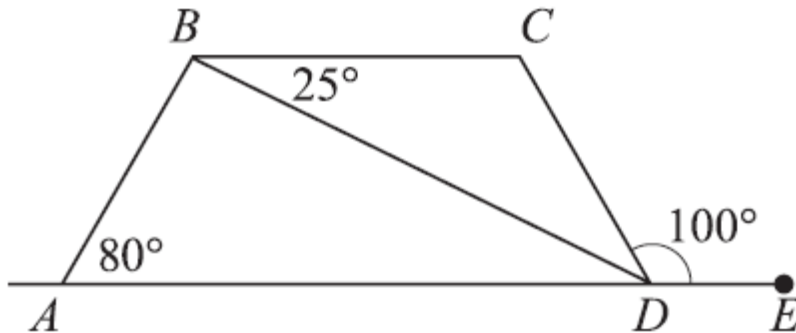
b) 9

c) 18

d) 27

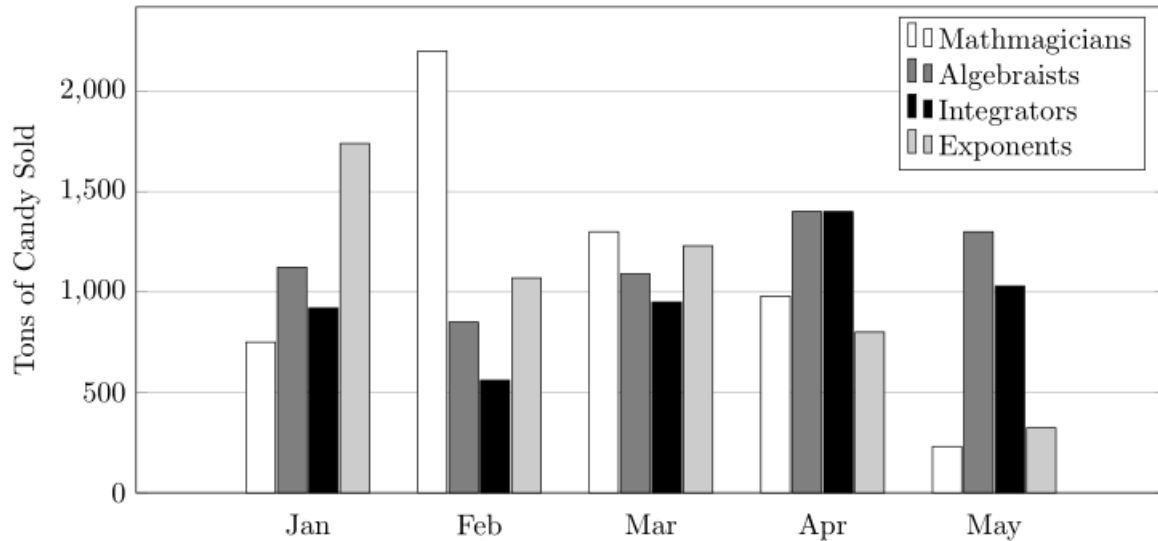
e) 54

20. In the figure below, $ABCD$ is a trapezoid. E lies on line AD , and angle measures are as marked. What is the measure of angle CDB ?



- a) 25°
b) 30°
c) 55°
d) 80°
e) 100°
21. Mandy and Jordan each bought some of the same notebooks and the same three-ring binder. Mandy paid \$5.85 for 3 notebooks and 1 binder. Jordan paid \$4.65 for two notebooks and 1 binder. What is the price of one of the notebooks?
- a) \$2.70
b) \$2.25
c) \$1.80
d) \$1.20
e) \$0.75
22. Gary has turtles, cats, and birds for pets. The number of birds is 4 more than the number of turtles, and the number of cats is 2 times the number of birds. Of the following, which could be the total number of Gary's pets?
- a) 14
b) 18
c) 20
d) 22
e) 26

23. Walmart sells four types of mathematical gum: Mathmagicians, Algebraists, Integrators and Exponents. The graph below shows the number of tons of each that was sold during the first five months of 2016. Which type of gum did they sell the most of during March and April (combined)?



- a) Mathmagicians
- b) Algebraists
- c) Integrators
- d) Exponents
- e) There is not enough information provided to answer this question.

24. If the volume of a cube is 64 cubic inches, what is the shortest distance from the center of the cube to the base of the cube?

- a) 2 inches
- b) 4 inches
- c) $2\sqrt{4}$ inches
- d) $\sqrt{32}$ inches
- e) 16 inches

25. The sides of a triangle are 9, 12, and 15 centimeters long. What is the angle between the 2 shortest sides?

- a) 180°
- b) 90°
- c) 60°
- d) 45°
- e) 30°

26. In a pentagon the average of four of the interior angles is 100° . What is the measure of the fifth interior angle?

- a) 50°
- b) 120°
- c) 140°
- d) 160°
- e) It is impossible to determine the measure of the fifth interior angle.

27. Kate rode her bicycle to visit her grandmother. The trip to Kate's grandmother's house was mostly uphill, and took m minutes. On the way home, Kate rode mostly downhill and was able to travel at an average speed twice that of her trip to her grandmother's house. Which of the following expresses the total number of minutes that Kate bicycled on her entire trip?

- a) $3m$
- b) $2m$
- c) $m + \frac{1}{2}$
- d) $\frac{3m}{2}$
- e) $\frac{m}{2}$

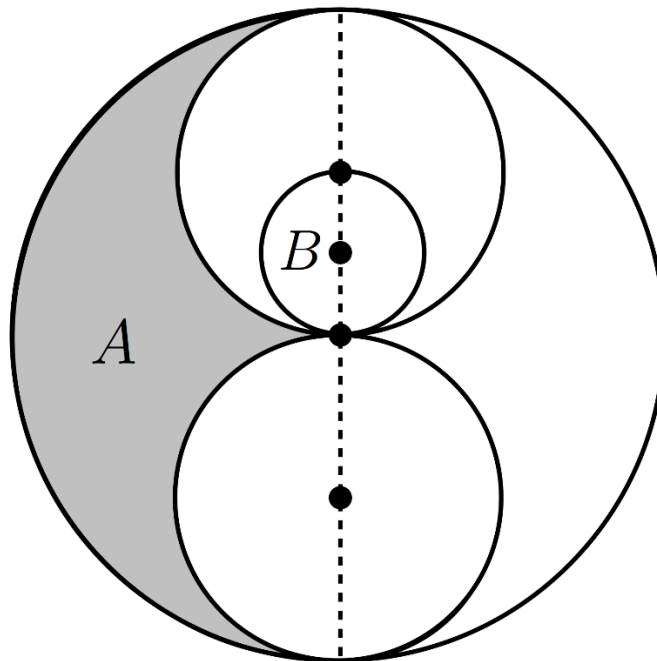
28. Let n equal $3a + 2b - 7$. What happens to the value of n if the value of a increases by 2 and the value of b decreases by 1?

- a) It is unchanged.
- b) It decreases by 1.
- c) It increases by 4.
- d) It decreases by 4.
- e) It decreases by 2.

29. Which of the following statements is/are false?

- a) There are $1\frac{1}{2}$ one-thirds in one-half.
- b) There are $1\frac{1}{2}$ four-thirds in two.
- c) There are $1\frac{1}{2}$ five-thirds in two and a half.
- d) None of the statements in a), b), and c) are false.
- e) Each of the statements in a), b), and c) is false.

30. Consider the image below consisting of 4 circles. The centers have been marked and all lie on a diameter of the large circle. If A is the area of the shaded region, and B is the area of the smallest circle, what is $A \div B$?



- a) 3
- b) π
- c) 2π
- d) 5
- e) 4