Intermediate Math

1. Two angles of a triangle each measure 70°. What is the measure of the third angle in degrees?

A. 40°

B. 80°

C. 100°

D. 120°

E. 140°

2. If Jack needs 2 ½ pints of cream to make a dessert. How many pints will he need to make 3 desserts?

A. 2 ½

B. 3

C. 4

D. 5

E. 7 ½

3. A discount store takes 50% off of the retail price of a desk. For the store's holiday sale, it takes an additional 20% off of all furniture. The desk's retail price was $320. How much is the desk on sale for during the holiday sale?

A. $107

B. $114

C. $128

D. $136

E. $192

4. Which vacation destination is most common for the students?

Vacation Destinations for Students
Attending Washington Middle School
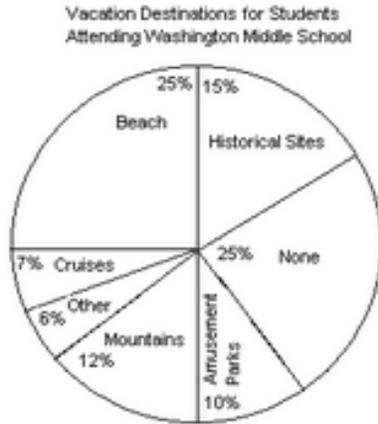
A. Beach

B. Historical Sites

C. Cruises

D. Mountains

E. Other

5. If 500 students attend Washington Middle School, how many are going to the mountains for vacation?

A. 25

B. 60

C. 75

D. 100

E. 125

6. If a ¼ of a teaspoon is 1 ml, then how many milliliters are in 6 teaspoons?

2

A. 10 ml

B. 12.5 ml

C. 15 ml

D. 20 ml

E. 24 ml

7. Which of the following is the correct graph for x≥3 or x≤ -2?
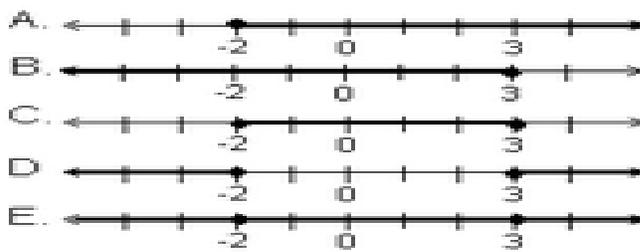
A. Line A

B. Line B

C. Line C

D. Line D

E. Line E

8. A scale on a map states that every ¼ of an inch represents 20 miles. If two cities are 3 ½ inches apart, how many miles are actually between the two cities?

A. 14 miles

B. 20 miles

C. 125 miles

D. 230 miles

E. 280 miles

9. Michelle wants to expand her flowerbed by increasing the length and width each by 2 ft. What will the new area of the flowerbed be, if L and W represent the original dimensions of the flowerbed's length and width?

A. 2 LW

B. 2 (L+W)

C. 2L +2W

D. (L+2) (W+2)

E. LW/2

10. Melinda's lights went out. She has 3 pairs of red socks in her drawer, 2 pairs of black socks, and 5 pairs of white socks. What is the minimum number of pairs she must remove from the drawer to ensure that she has a pair of each color?

A. 3

B. 5

C. 7

D. 9

E. 10

11. Which of the following fractions are correctly placed from the least in value to the greatest in value?

A. 1/4, 17/25, 3/4, 11/16

B. 17/25, 1/4, 11/16, 3/4

C. 1/4, 17/25, 11/16, 3/4

D. 1/4, 17/25, 3/4, 11/16

E. 3/4, 17/25, 11/16, 1/4

12. What is the mathematical average of the number of days in a typical year, the number of days in a week, and the number of hours in a day?

A. 100

B. 115

C. 132

D. 158

E. 224

13. 1.75 x 105=

A. 175,000

B. 17,500

C. 1,750

D. 0.00175

E. 0.000175

14. The electric company charges 3 cents per kilowatt-hour. George used 2800 kilowatt-hours in April, 3200 kilowatt-hours in May, and 3600 kilowatt-hours in June. What was his average cost of electricity for the 3 months?

A. $72

B. $88

C. $96

D. $102

E. $113

15. On a map, 1/3 inch equals 15 miles. The distance between two towns on a map is 3 2/3 inches. How many miles are actually between the two towns?

A. 11

B. 16

C. 88

D. 132

E. 165

16. James invested $4,000 at 5% interest per year; how long will it take him to earn $200 in simple interest?

A. 1 year

B. 2 years

C. 3 years

D. 4 years

E. 5 years

17. John pays $650 in property tax. What is the assessed value of his property if property taxes are 1.2% of assessed value?

A. $28,800.27

B. $41,328.90

C. $43,768.99

D. $54,166.67

E. $64,333.39

18. A lamp is marked with a sale price of $23.80, which is 15% off of the regular price. What is the regular price?

A. $26

B. $28

C. $30

D. $32

E. $43

19. A mattress store sells their stock for 15% off of retail. If someone pays cash, they take an additional 10% off of the discounted price. If a mattress's retail price is $750, what is the price after the store discount and the cash discount?

A. $550.75

B. $562.50

C. $573.75

D. $637.50

E. $675.00

20. 85% of what number is 136?

A. 160

B. 170

C. 180

D. 190

E. 220

21. A building that is 150 ft tall casts a shadow of 20 feet long. At the same time a tree casts a shadow of 2 ft. How tall is the tree?

A. 10

B. 15

C. 20

D. 25

E. 30

22. Which of the following is a true statement?

A. The product of two negative numbers is negative.

B. The product of one negative and one positive number is positive.

C. When dividing a positive number by a negative number, the results are negative.

D. When dividing a negative number by a positive number, the results are positive.

E. When dividing a negative number by a negative number the results are negative.

23. What is the fractional equivalent of 12.5%?

A. 1/4

B. 2/9

C. 1/5

D. 1/8

E. 2/7

24. Change 4 3/5 to an improper fraction.

A. 23/5

B. 7/5

C. 12/20

D. 20/12

E. 12/5

25. The fine for a driver riding in the carpool lane without any passengers is $133. A driver is issued a bench warrant for $2,294.25, which includes a 15% fee for late charges and court costs. How many tickets has the driver not paid?

A. 10

B. 12

C. 13

D. 14

E. 15

26. Brett started a race at 6:30 A.M., and he did not cross the finish line until 1:05 P.M. How long did it take for Brett to finish the race?

A. 6 hours and 15 minutes

B. 6 hours and 35 minutes

C. 7 hours and 5 minutes

D. 7 hours and 15 minutes

E. 7 hours and 35 minutes

27. What is the fraction equivalent of the shaded region in the following circle?

A. 2/3

B. 3/8

C. 4/5

D. 3/4

E. 7/16

28. Multiply 2.345 x 0.023

A. 0.53935

B. 0.053935

C. 0.0053935

D. 10.195652

E. 101.95652

29. A men's basketball team won 24 games and lost 32. What is the ratio of games lost to the number of games played?

A. 32:24

B. 4:3

C. 3:4

D. 4:7

E. 3:7

30. Which of the following choices is equivalent to 5/6?

A. 5/12

B. 10/6

C. 20/30

D. 15/24

E. 15/18

31. Jill earns $120 for 8 hours of work. At the same pay rate, how much will she earn for 15 hours of work?

A. $180

B. $225

C. $245

D. $280

E. $310

32. Which two years were the least number of tires sold?

The Number of Tires Sold by XYZ Company

1998

1999

2000

2001

One Tire
Equal
5,000
Tires
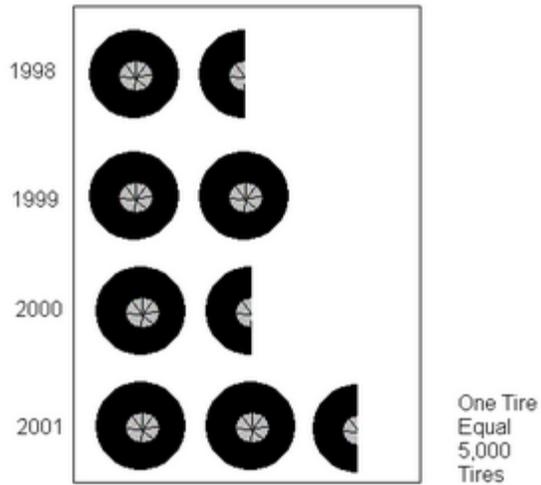
A. 1998 and 1999

B. 1998 and 2000

C. 1998 and 2001

D. 1999 and 2000

E. 2000 and 2001

33. Which year did the store sell 1/3 more tires than the year before?

A. 1998

B. 1999

C. 2000

D. 2001

E. This did not occur during the 4 year span.

34. What was the average number of tires sold by the store from 1998 to 2001?

A. 9,000

B. 9,375

C. 9,545

D. 9,770

E. 9,995

35. A salesman sold 20 cars in the month of July, and 40 cars the month of August. What is the percent increase in the number of cars the salesman sold?

A. 50%

B. 100%

C. 150%

D. 200%

E. 250%

36. If one side of a square is 5 units, what is the area of the square?

A. 10

B. 15

C. 20

D. 25

E. 30

37. If 8x + 5 = 21, then 3 x + 4 =

A. 2

B. 5

C. 10

D. 16

E. 17

38. In triangle ABC, AB=BC and (C's measure is 65°.) What is the measure of angle B?

A. 40°

B. 50°

C. 60°

D. 65°

E. 75°

39. If the average arithmetic mean of 8, 12, 15, 21, x and 11 is 17 then what is x?

A. 3

B. 15

C. 17

D. 35

E. 42

40. Sarah has a 20 dollar bill and a 5 dollar bill. If she purchases two items, one for $11.23 and the other for $8.32, then how much money does she have left over?

A. $3.75

B. $5.45

C. $6.34

D. $7.77

E. $8.12

Answers & Explanations

1. A: The sum of the two given angles is 140°. The measure of the third angle is equal to the difference of 180° and 140°, or 40°.

2. E: The amount he will need for 3 desserts is equal to the product of 2 1/2 and 3, or 7 1/2.

3. C: Application of the 50% discount gives the expression, 320 - 0.50(320), which equals 160. Application of the additional 20% discount to this amount, gives the expression, 160 - 0.20(160), which equals 128. Thus, the sale price of the desk was $128.

4. A: 25% is larger than any of the percentages given for the other destinations, thus the beach is the most common destination.

5. B: The number of students going to the mountains is equal to the product of 0.12 and 500, which equals 60.

6. E: The following proportion may be written: (1/4)/1=6/x. Solving for x gives x = 24. Thus, there are 24 milliliters in 6 teaspoons.

7. D: The correct graph should show one ray, with a closed point on the integer, -2, which points to the left, and another ray, with a closed point on the integer, 3, which points to the right.

8. E: The following proportion may be written: (1/4)/20=(3 1/2)/x, which simplifies to 1/4 x=70, where x = 280. Thus, there are actually 280 miles between the two cities.

9. D: The new length may be represented by the expression, L + 2, while the new width may be represented by the expression, W + 2. Thus, the area is equal to the product of the two dimensions, or (L + 2)(W + 2).

10. D: Removal of 9 pair will ensure that she has one of each color because all 3 colors will be represented. Removal of 7 pair may include only pairs of black and white socks, while not including a red pair.

11. C: The fractions in Choice C may be converted to the following decimals: 0.25, 0.68, 0.6875, 0.75, which are indeed in order from least to greatest.

12. C: The average may be written as (365+7+24)/3, which equals 132.

13. A: Moving the decimal 5 places to the right gives 175,000.

14. C: The average may be written as (0.03(2800+3200+3600))/3, which equals 96.

15. E: The following proportion may be written: (1/3)/15=(3 2/3)/x, which simplifies to 1/3 x=165/3, where x = 165. Thus, there are actually 165 miles between the two cities.

16. A: Simple interest may be calculated using the formula, I = Prt, where P represents the principal amount, r represents the rate, and t represents the length of time. Substituting 200 for I, 4000 for P, and 0.05 for r gives 200 = (4000)(0.05)t. Thus, t = 1. It will take him 1 year to earn $200 in simple interest.

17. D: The following equation may be solved for x: 650 = 0.012x. Dividing both sides of the equation by 0.012 gives x = 54,166.67. Thus, the assessed value of his property is $54,166.67.

18. B: The problem may be modeled with the equation, 23.80 = x - 0.15x, which simplifies to 23.80 = 0.85x. Dividing both sides of the equation by 0.85 gives x = 28. So, the regular price of the lamp is $28.

19. C: The expression, 750 - 0.15(750), may be used to represent the price, after the first discount. This amount is $637.50. Taking an additional 10% off of the discounted price is represented by the expression, 637.50 - 0.10(637.50), which equals 573.75. Thus, the price after both discounts is $573.75.

20. A: The problem may be modeled and solved, using the equation, 0.85x = 136. Solving for x gives x = 160.

21. B: The following proportion may be written: 150/20=x/2. Solving for x gives x = 15. Thus, the height of the tree is 15 feet.

22. C: Dividing a positive number by a negative number gives a negative quotient. For example, 4/(-2)=-2.

23. D: 1/8=0.125, which is equivalent to 12.5%.

24. A: In order to change the mixed number to an improper fraction, the denominator should first be multiplied by the whole number. Next, the numerator should be added to this product. The resulting value should be placed over the original denominator of the fractional portion of the mixed number. 4 3/5=23/5 because (5 x 4) + 3 = 23 and 23 divided by 5 is written as 23/5.

25. E: The following equation may be used to solve the problem: 133x + 0.15(133x) = 2294.25. Solving for x gives x = 15. So, the driver has not paid 15 tickets.

26. B: Six hours passed, from 6:30 A.M. to 12:30 P.M. Thirty-five more minutes passed from 12:30 P.M. to 1:05 P.M. So, it took him 6 hours and 35 minutes to finish the race.

27. A: The circle is divided into 3 equal sections, whereby 2 of them of are shaded. Thus, the represented fraction is 2/3.

28. B: The decimals may be multiplied as integers. However, the decimal will have six place values to the right of the decimal.

29. D: The ratio may be written as 32/56, which reduces to 4/7. Thus, the ratio of games lost to games played is 4: 7.

30. E: 5/6=15/18 because the numerator and denominator of the first fraction are both multiplied by 3.

31. B: The following proportion may be written: 120/8=x/15. Solving for x gives x = 225. She earns $225 for 15 hours of work.

32. B: 7,500 tires were sold in each of the years, 1998 and 2000. This number was the least amount sold in a year, as evidenced by one and a half tires shown for these years, as compared to two and two and a half for the other two years.

33. B: Using the number of tires shown, the year of 1999 may be represented by the expression, 1 1/2+1/3 (1 1/2), which equals 2. Since 2 is 1/3 more than 1 1/2, the number of tires sold in 1999 was 1/3 more than the number sold in 1998.

34. B: The average may be written as (7500+10000+7500+12500)/4, which equals 9,375.

35. B: The percent increase may be represented as (40-20)/20, which equals 1. 1 = 100%. So, the percent increase was 100%.

36. D: A=s2, so the area may be written as A=52; A = 25. The area of the square is 25 square units.

37. C: The first equation may be solved for x. Doing so gives x = 2. Substituting 2 for x, into the second equation, gives 3(2) + 4, or 10.

38. B: Each of the base angles measures 65°, since the triangle is isosceles. Thus, the same of the base angles is 130°. The measure of angle B is equal to the difference of 180° and 130°, or 50°.

39. D: The average may be written as (8+12+15+21+x+11)/6=17, which simplifies to (67+x)/6=17. Multiplying both sides of the equation by 6 gives 67 + x = 102. Subtracting 67 from both sides of the equation gives the solution of x = 35.

40. B: The solution may be represented by the expression, 25 - (11.23 + 8.32), which equals 5.45. Thus, she has $5.45 left over.