

M.S. 267
Math, Science and Technology



Summer Vacation Math Packet
2023-2024
Grade 7 Rising Class

Name: _____
Due Date: September 7th, 2023

Grade 7 Mathematics Reference Sheet

CONVERSIONS

1 inch = 2.54 centimeters

1 meter = 39.37 inches

1 mile = 5,280 feet

1 mile = 1,760 yards

1 mile = 1.609 kilometers

1 kilometer = 0.62 mile

1 pound = 16 ounces

1 pound = 0.454 kilogram

1 kilogram = 2.2 pounds

1 ton = 2,000 pounds

1 cup = 8 fluid ounces

1 pint = 2 cups

1 quart = 2 pints

1 gallon = 4 quarts

1 gallon = 3.785 liters

1 liter = 0.264 gallon

1 liter = 1,000 cubic centimeters

FORMULAS

Triangle

$$A = \frac{1}{2}bh$$

Parallelogram

$$A = bh$$

Circle

$$A = \pi r^2$$

Circle

$$C = \pi d \text{ or } C = 2\pi r$$

General Prisms

$$V = Bh$$

< PART I >

1

An equation is shown below.

$$12 - 9 + c = 12$$

What value of c makes the equation true?

- A 0
- B 3
- C 9
- D 12

2

Kate has a coin collection. She keeps 7 of the coins in a box, which is only 5% of her entire collection. What is the total number of coins in Kate's coin collection?

- A 12
- B 14
- C 120
- D 140

3

What is the greatest common factor of 36 and 90?

- A 6
- B 18
- C 36
- D 180

GO ON

4

The relationship between Robert's age, r , and Julia's age, j , can be represented by the equation shown below.

$$r = j + 3$$

Which table of values represents the relationship between Robert's age and Julia's age?

POSSIBLE AGES

A

Robert's Age, r (years)	Julia's Age, j (years)
9	12
15	18
21	24

POSSIBLE AGES

C

Robert's Age, r (years)	Julia's Age, j (years)
9	6
15	12
21	18

POSSIBLE AGES

B

Robert's Age, r (years)	Julia's Age, j (years)
9	3
15	5
21	7

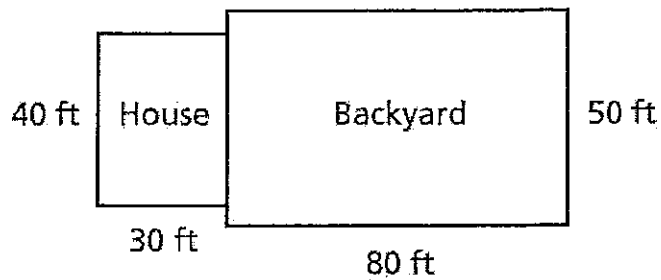
POSSIBLE AGES

D

Robert's Age, r (years)	Julia's Age, j (years)
9	27
15	45
21	63

5

The diagram below shows the dimensions of a rectangular house with a rectangular backyard.



What is the total area, in square feet, of the house and backyard?

- A 200
- B 400
- C 4,000
- D 5,200

6

A bagel shop sold 8 plain bagels and 13 rye bagels. What is the ratio of the number of rye bagels to the number of plain bagels sold?

- A 8 : 13
- B 13 : 8
- C 8 : 21
- D 21 : 8

GO ON

7

A rectangle is graphed on a coordinate plane. The coordinates for two of the vertices of the rectangle are $(-5, 8)$ and $(-5, -6)$. What is the distance between the two vertices?

- A 2 units
- B 4 units
- C 10 units
- D 14 units

8

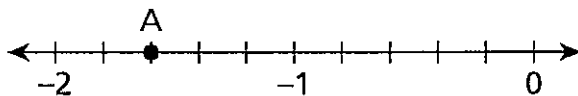
What value of m makes the equation below true?

$$m + 7.9 = 39\frac{1}{2}$$

- A 5.0
- B 31.6
- C 32.4
- D 47.4

9

Point A is shown on the number line below.



What is the location of point A?

- A -1.3
- B -1.35
- C -1.6
- D -1.75

GO ON

10

A right rectangular prism has a base with an area of $25\frac{1}{2}$ square feet and a volume of 153 cubic feet. What is the height, in feet, of the right rectangular prism?

- A 6
- B 51
- C $127\frac{1}{2}$
- D $3,901\frac{1}{2}$

11

All the students in the sixth grade either purchased their lunch or brought their lunch from home on Monday.

- 24% of the students purchased their lunch.
- 190 students brought their lunch from home.

How many students are in the sixth grade?

- A 76
- B 166
- C 214
- D 250

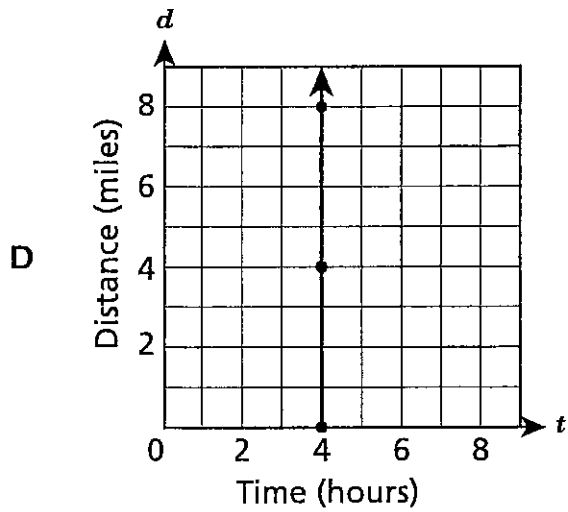
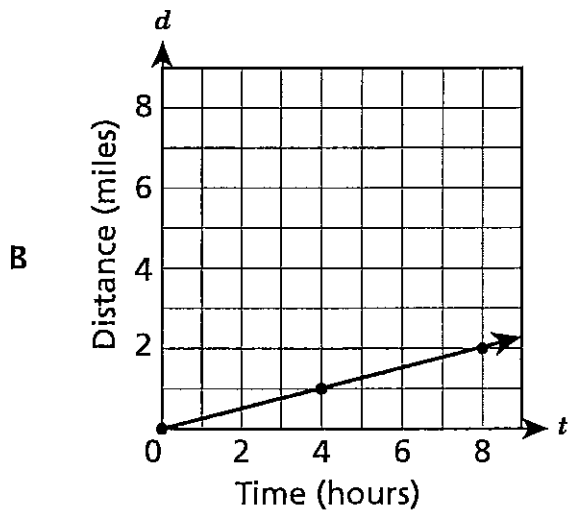
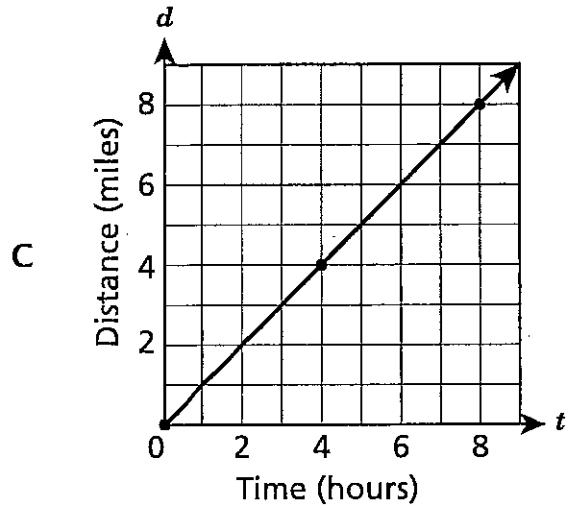
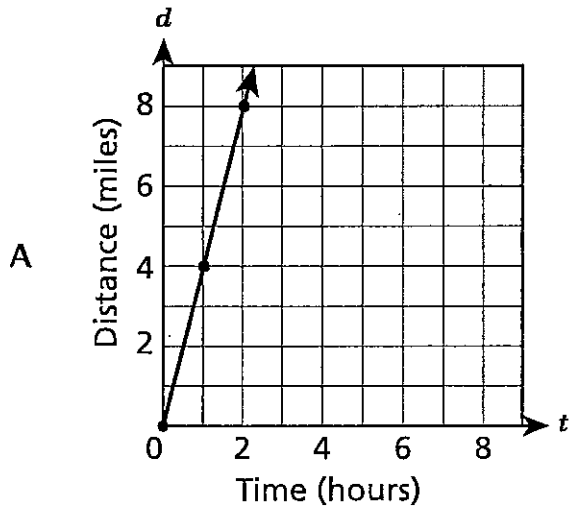
GO ON

12

Joe walks on a treadmill at a constant rate. The equation below describes the relationship between t , the time he walks in hours, and d , the distance he walks in miles.

$$d = 4t$$

Which graph represents the relationship between the amount of time Joe walks and the distance he walks?



13

An expression is shown below.

$$\frac{143 - 35}{3^3}$$

What is the value of the expression?

- A 4
- B 9
- C 12
- D 18

14

There are 230 calories in 4 ounces of a type of ice cream. How many calories are in 6 ounces of that ice cream?

- A 232
- B 236
- C 345
- D 460

15

What value of x makes the equation $33x = 11$ true?

- A $\frac{1}{3}$
- B $\frac{3}{11}$
- C $\frac{11}{3}$
- D 3

GO ON

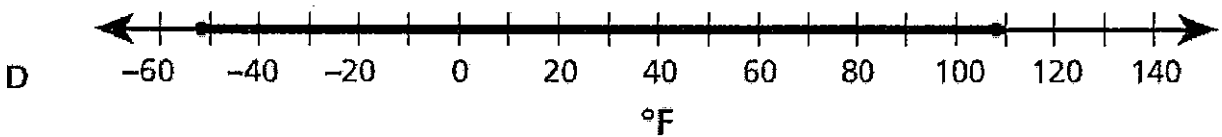
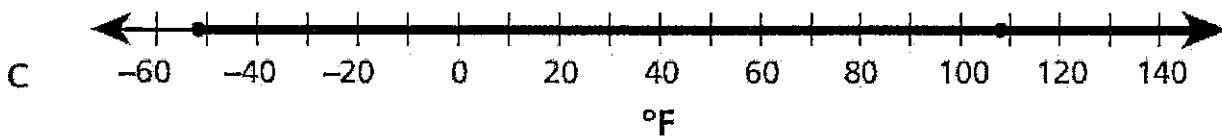
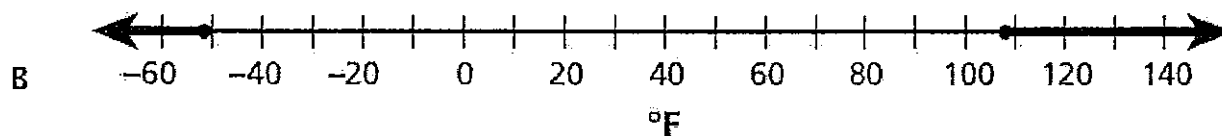
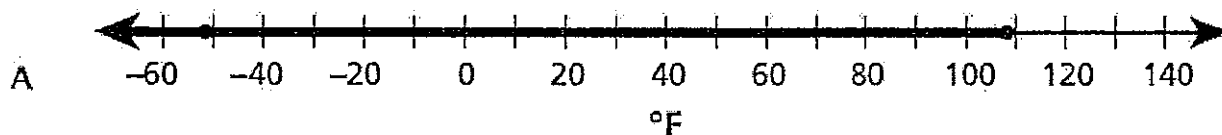
16

A shape is made of 12 right triangles of equal size. Each right triangle has a base of 4 cm and a height of 5 cm. What is the total area, in square centimeters, of the shape?

- A 10
- B 60
- C 120
- D 240

17

According to the National Climatic Data Center, the lowest recorded temperature in the state of New York is -52°F and the highest is 108°F . Based on these values, which number line best represents the range of temperatures in the state of New York?



18

Pat bounces a basketball 25 times in 30 seconds. At that rate, approximately how many times will Pat bounce the ball in 150 seconds?

- A 120
- B 125
- C 144
- D 145

19

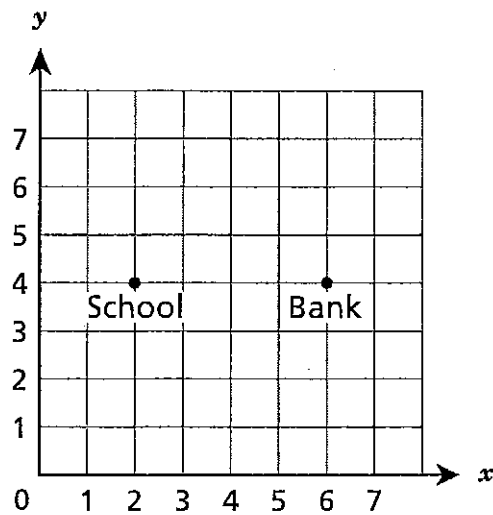
Which expression is equivalent to $5(4x + 3) - 2x$?

- A $18x + 15$
- B $18x + 3$
- C $7x + 8$
- D $2x + 8$

GO ON

20

Mark graphed points on the coordinate plane below to represent the locations of his school and a bank.

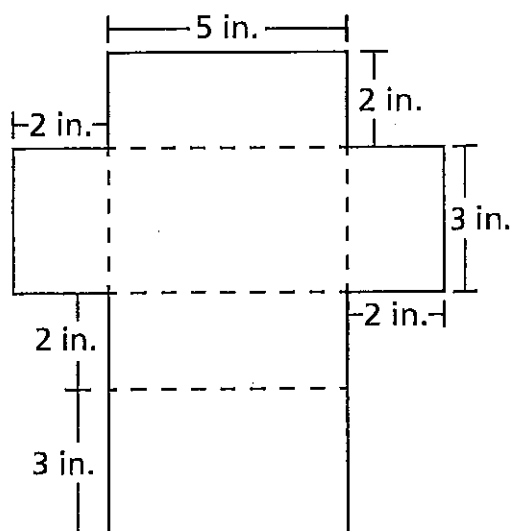


Mark wants to add the location of the library on the coordinate plane. The distance from the library to the school is the same as the distance from the bank to the school. Which ordered pair could be the coordinates of the library?

- A (2, 4)
- B (2, 8)
- C (4, 4)
- D (6, 8)

21

A student draws the net below to show the dimensions of a container that is shaped like a right rectangular prism.



What is the surface area, in square inches, of the container?

- A 19
- B 30
- C 38
- D 62

22

Which two expressions are equivalent?

- A $x + x + x$ and x^3
- B $14x + 10 - 2x$ and $16x + 10$
- C $12x + 16x$ and $4(3x + 4x)$
- D $12x^2 + 5x + 10$ and $17x^2 + 10$

GO ON

23

A machine fills boxes at a constant rate. At the end of 35 minutes, it has filled 5 boxes. Which table represents the relationship between the number of minutes the machine fills boxes and the number of boxes it has filled?

FILLING BOXES

A

Time (minutes)	Boxes Filled
7	1
14	2
21	3
28	4

FILLING BOXES

C

Time (minutes)	Boxes Filled
1	7
2	14
3	21
4	28

FILLING BOXES

B

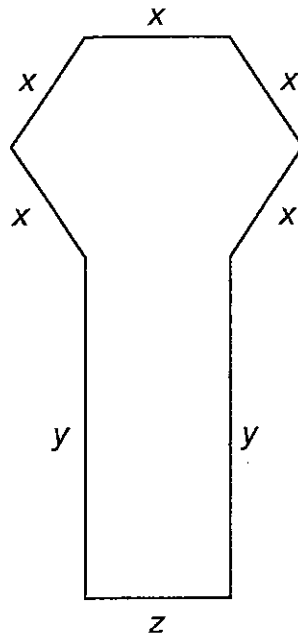
Time (minutes)	Boxes Filled
5	1
10	2
15	3
20	4

FILLING BOXES

D

Time (minutes)	Boxes Filled
1	5
2	10
3	15
4	20

Which expression represents the perimeter of the figure below?



- A $5x + 2y$
- B $x + y + z$
- C $5x + 2y + z$
- D $(5 + 2 + 1)(x + y + z)$

STOP

< PART II >

1

Clara goes miniature golfing. She pays \$7.50 for an admission ticket and \$6.25 for each round she golfs. The total amount Clara pays for admission and the number of rounds she golfs is \$26.25. Which equation can be used to determine the number of rounds, x , that Clara golfs?

A $6.25x + 7.50 = 26.25$

B $6.25x - 7.50 = 26.25$

C $7.50x + 6.25 = 26.25$

D $7.50x - 6.25 = 26.25$

2

What is the exact decimal equivalent of $\frac{7}{12}$?

A 0.583

B $0.58\bar{3}$

C 1.714

D $1.71\bar{4}$

3

Joseph's lunch at a restaurant costs \$13.00, without tax. He leaves the waiter a tip of 17% of the cost of the lunch, without tax. What is the total cost of the lunch, including the tip, without tax?

A \$2.21

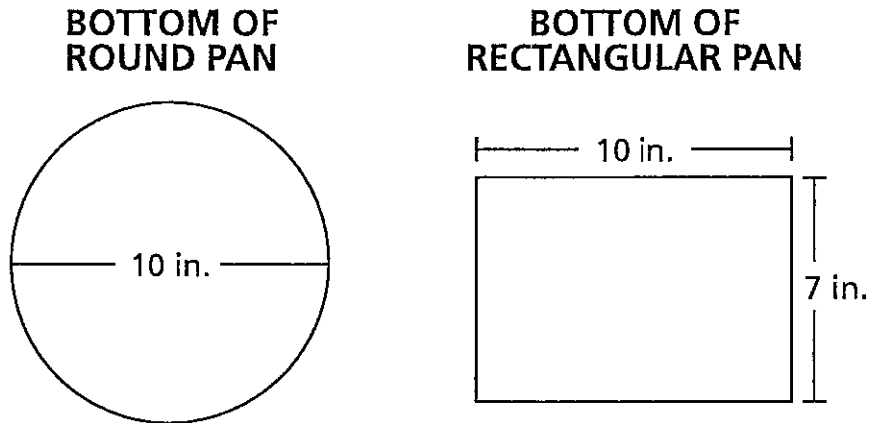
B \$10.79

C \$13.17

D \$15.21

GO ON

- 4 Jordan is baking brownies and will choose to use either a round or a rectangular pan. The dimensions of the bottom of each pan are shown below.



Which statement correctly describes how the area of the bottom of the round pan compares to the area of the bottom of the rectangular pan?

- A The area of the bottom of the round pan is greater than the area of the bottom of the rectangular pan by about 8.5 square inches.
- B The area of the bottom of the round pan is greater than the area of the bottom of the rectangular pan by about 244.2 square inches.
- C The area of the bottom of the round pan is less than the area of the bottom of the rectangular pan by about 7.2 square inches.
- D The area of the bottom of the round pan is less than the area of the bottom of the rectangular pan by about 38.6 square inches.

- 5 On average, Shawnte drinks $\frac{1}{2}$ of a 6-ounce glass of water in $\frac{2}{3}$ hour. How much water does she drink in an hour?

- A 0.75 ounce
- B 2 ounces
- C 4.5 ounces
- D 9 ounces

6

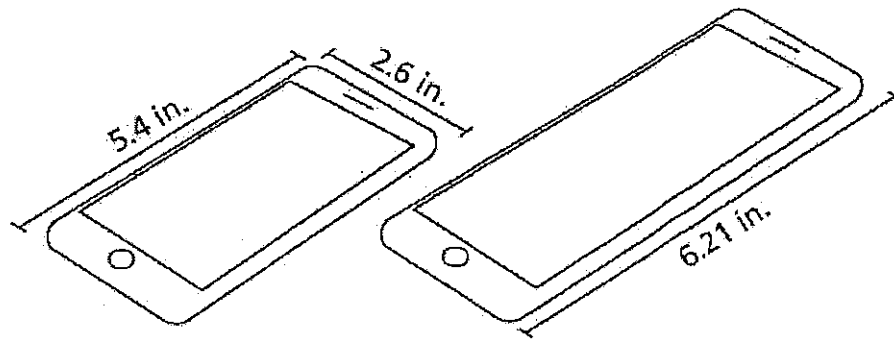
What is the value of the expression shown below?

$$\frac{-(-4)(-6) - \frac{8}{5}(10 + 15)}{\frac{1}{3}}$$

- A -117
- B -13
- C 3
- D 27

7

The diagram shows the length and width of a cell phone, and the length of a larger version of the same brand of cell phone.



The lengths and widths of the two cell phones are proportional. What is the width, in inches, of the larger version of the cell phone?

- A 1.15
- B 2.26
- C 2.99
- D 3.41

GO ON

8

From 12:00 midnight to 6:00 a.m., the temperature decreased by 12°C . If the original temperature was 12°C , which expression can be used to represent this situation?

- A $12 - 12$
- B $12 + 12$
- C $12 - (-12)$
- D $-12 + (-12)$

9

Jordan prepares 200 name tags to use at a meeting. The number for each color of name tag is described below.

- 35% of the name tags are blue
- $\frac{3}{8}$ of the name tags are yellow
- all of the remaining name tags are red

How many of Jordan's name tags are red?

- A 55
- B 90
- C 110
- D 145

10

The ratio of boys to girls in Mr. Johnson's after-school club is the same as the ratio of boys to girls in Ms. Greene's after-school club. There are 4 boys and 12 girls in Mr. Johnson's club. There are 6 boys in Ms. Greene's club. How many girls are in Ms. Greene's club?

- A 2
- B 12
- C 14
- D 18

11

The regular price of an item at a store is p dollars. The item is on sale for 20% off the regular price. Some of the expressions shown below represent the sale price, in dollars, of the item.

Expression A: $0.2p$

Expression B: $0.8p$

Expression C: $1 - 0.2p$

Expression D: $p - 0.2p$

Expression E: $p - 0.8p$

Which two expressions each represent the sale price of the item?

- A Expression A and Expression E
- B Expression B and Expression C
- C Expression B and Expression D
- D Expression C and Expression D

GO ON

12

Last week, the price of apples at a grocery store was \$1.60 per pound. This week, apples at the same grocery store are on sale at a 10% discount. What is the total price of $4\frac{1}{2}$ pounds of apples this week at the grocery store?

- A \$4.77
- B \$6.48
- C \$6.75
- D \$6.93

13

An object travels along a horizontal straight path at a constant rate. The object travels $\frac{1}{20}$ of the length of the path in $\frac{3}{4}$ second. At that rate, how many seconds does it take the object to travel the entire length of the path?

- A 15
- B $15\frac{3}{4}$
- C 20
- D $20\frac{3}{4}$

14

A furniture store has a sale during which the sale price of a sofa is $\frac{1}{3}$ off its original price. The original price of the sofa is \$1,029.00. A customer can get an additional 5% discount off the sale price for paying with cash. At checkout, a 6.5% sales tax on the final price is added to the cost of the sofa. What is the total cost of the sofa, including sales tax, for a customer paying with cash?

- A \$343.00
- B \$651.70
- C \$686.00
- D \$694.06

GO ON

15

Which table shows a proportional relationship between x and y ?

A

x	y
3	4
6	10
9	16
12	22
15	28

C

x	y
4	2
8	4
12	8
16	14
20	20

B

x	y
12	6
14	12
16	18
18	24
20	30

D

x	y
5	1
10	2
15	3
20	4
25	5

16

Which expression is equivalent to $7a - 8 - 12a + 4$?

A $-9a$

B $31a$

C $-5a - 4$

D $19a + 12$

GO ON

17

A box contains paper clips of three different sizes. The numbers of each size of paper clip are listed below.

- 100 small paper clips
- 250 medium paper clips
- 150 large paper clips

One paper clip is randomly selected from the box. What is the probability that the paper clip selected is either small or medium?

- A $\frac{1}{3}$
- B $\frac{2}{3}$
- C $\frac{3}{7}$
- D $\frac{7}{10}$

18

What is $\frac{1}{2}\%$ of $\left[(-0.5) \times \left(-\frac{1}{4}\right)\right]$?

- A 0.000625
- B 0.00025
- C 0.065
- D 0.025

GO ON

19

Mario sells men's and women's shoes in his shoe store. He is considering selling children's shoes. He randomly selected 120 customers to participate in a survey. The survey results are shown below.

- 42 customers said they would shop for children's shoes
- 78 customers said they would not shop for children's shoes

Mario has an average of 440 customers per month. Based on the survey results, which value is the **best** estimate of the number of customers that would shop for children's shoes during an average month?

- A 120
- B 154
- C 220
- D 286

20

Danielle constructs a scale model of a building with a rectangular base. Her model is 2 inches in length and 1 inch in width. The scale on the model is 1 inch = 47 feet. What is the actual area, in square feet, of the base of the building?

- A 141
- B 282
- C 2,209
- D 4,418

21

What value will make the equation true?

$$-2.1 - \underline{\quad ? \quad} = -1\frac{1}{2}$$

- A 3.6
- B 0.6
- C -0.6
- D -3.6

22

Manny goes bowling.

- He has \$25.00 to spend.
- He spends \$4.25 to rent shoes.
- He spends \$2.50 for each game he bowls.

Which inequality can Manny use to determine x , the greatest number of games he can bowl?

- A $2.5 + 4.25x \geq 25$
- B $4.25 + 2.5x \geq 25$
- C $2.5 + 4.25x \leq 25$
- D $4.25 + 2.5x \leq 25$

GO ON

23

A middle school principal wants to change the lunch menu at the school. The principal surveys the students to determine how the students would feel about the changes. Which survey method will produce the **best** representative sample?

- A survey every fifth student who rides in a car to school
- B survey 3 randomly selected students from every homeroom
- C survey every tenth seventh-grade student during lunch
- D survey 5 randomly selected students from every art, drama, and music class

24

Kerry has a bag containing white and yellow marbles. Kerry randomly selects one marble from the bag, records the result, and returns the marble to the bag. The results of the first 65 selections are shown below.

- A white marble was selected 41 times.
- A yellow marble was selected 24 times.

Based on these results, what is the probability that the next marble Kerry selects, rounded to the nearest percent, will be white?

- A 41%
- B 50%
- C 59%
- D 63%

25

Which situation results in a final value of zero?

- A the overall change in temperature when the temperature goes from -10°F to 10°F
- B the total profit made when a person buys an item for \$2.25 and then sells the item for \$2.25
- C the overall change in altitude of a hot air balloon after rising 21 kilometers from sea level
- D the total distance a person travels when he bikes 3.1 miles to school and then bikes 3.1 miles back home

26

An equation is shown below.

$$2(x - 9) = 9 \div \left(-\frac{1}{3}\right)$$

What value of x makes the equation true?

- A -9.0
- B -4.5
- C 3.0
- D 7.5

STOP

