2013 ISAT Grade 8 Sample Book

Reference Sheet for Grade 8 Mathematics ISAT

All students in grade 8 will be provided with a reference sheet to use during all sessions of the mathematics assessment. This reference sheet is shown below.

ISAT MATHEMATICS REFERENCE SHEET
Grades 7 and 8

FORMULAS FOR PLANE FIGURES

Parallelogram: $A = bh$

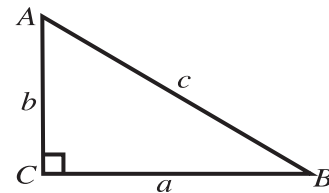Trapezoid: $A = \frac{1}{2}(b_1 + b_2)h$

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

Circle: $C = 2\pi r$ or $C = \pi d$

$A = \pi r^2$

Right Triangle:

> The Pythagorean Theorem
> $c^2 = a^2 + b^2$

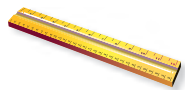
FORMULAS FOR SOLID FIGURES

Prism: $V = Bh$ (B is the area of the base.)

Right Cylinder: $V = \pi r^2 h$

Regular Pyramid: $V = \frac{1}{3}Bh$ (B is the area of the base.)

1

One light-year is approximately 5,880,000,000,000 miles.

Which expression represents this distance in scientific notation?

A 5.88×10^{10}
B 5.88×10^{12}
C 58.8×10^{11}
D 588×10^{10}

2

Which point on the number line below best represents the value $\sqrt{10}$?

P		Q R		S	
0	1	2	3	4	5	6

A Point P
B Point Q
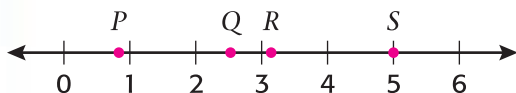C Point R
D Point S

3

Amy has $\frac{3}{4}$ of a yard of string to make bracelets. Each bracelet requires $\frac{1}{8}$ of a yard of string.

What is the greatest number of bracelets Amy can make with this length of string?

8	6	4	3
A	B	C	D

4

Paula multiplied a number by 16. Her result is a positive number less than 16. Which of these did Paula multiply by 16?

A A number between zero and one
B A number greater than one
C A number less than zero
D Zero

5
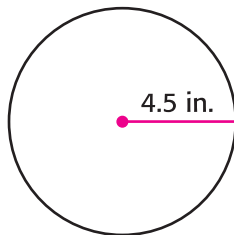
Between which two consecutive integers is $\sqrt[3]{300}$?

A 6 and 7
B 17 and 18
C 75 and 76
D 100 and 101

GO ON ▶

6

Last year there were 80 students enrolled in the eighth-grade class. This year the number of students enrolled in the eighth-grade class increased by 10%.

How many students are enrolled in the eighth-grade class this year?

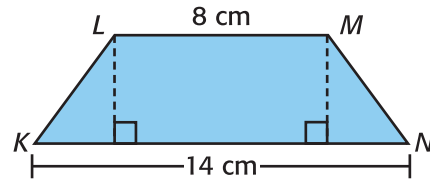| 8	81	88	90
A	**B**	**C**	**D**

7

4.5 in.

Which is closest to the circumference of this circle? (Use 3.14 for π.)

A	14 inches	**C**	28 inches
B	20 inches	**D**	63 inches

8

Quadrilateral *KLMN* is an isosceles trapezoid with a perimeter of 32 cm.

What is the area of quadrilateral *KLMN*?

A   44 cm^2
B   55 cm^2
C   88 cm^2
D   112 cm^2

9

A company packs its coffee into cylindrical containers. The height of each container is 6 inches, and the radius of the container is 3 inches.
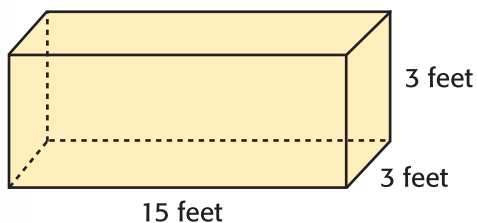
Which is closest to the volume of one of these cylindrical containers? (Use 3.14 for π.)

A   36 cubic inches
B   54 cubic inches
C   113 cubic inches
D   170 cubic inches

GO ON ▶

10

What is the surface area of this rectangular prism?

3 feet

3 feet

15 feet

A   135 square feet
B   155 square feet
C   180 square feet
D   198 square feet

11

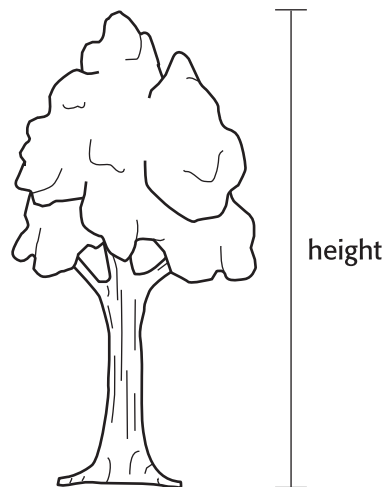When filled to capacity, a container holds 4.6 liters of liquid. How many milliliters (mL) is this?

A   0.46 mL
B   46 mL
C   460 mL
D   4600 mL

12

Use your inch ruler to help you answer this question.

The picture shows the scale drawing of a tree.

height

1 inch represents 5 feet.

Which is closest to the height in feet of the actual tree?

A   10 feet
B $10\frac{1}{2}$ feet
C $12\frac{1}{2}$ feet
D   15 feet

GO ON ▶

13

Look at the addition patterns below.

$1 + 3 = 4$
$1 + 3 + 5 = 9$
$1 + 3 + 5 + 7 = 16$
$1 + 3 + 5 + 7 + 9 = 25$

How many consecutive odd integers starting with 1 must be added to produce 64?

6	7	8	9
A	**B**	**C**	**D**

14

Which expression satisfies the pattern below?

n	?
0	0
1	1
2	4
3	9
4	16

A $4n^2 - 3$ **C** n^3
B $3n^2$ **D** n^2

15

Which is equivalent to the expression below?

$$\frac{x}{2} - 1$$

A $\dfrac{x-1}{2}$ **C** $x - 1$

B $\dfrac{x-2}{2}$ **D** $x - 2$

16

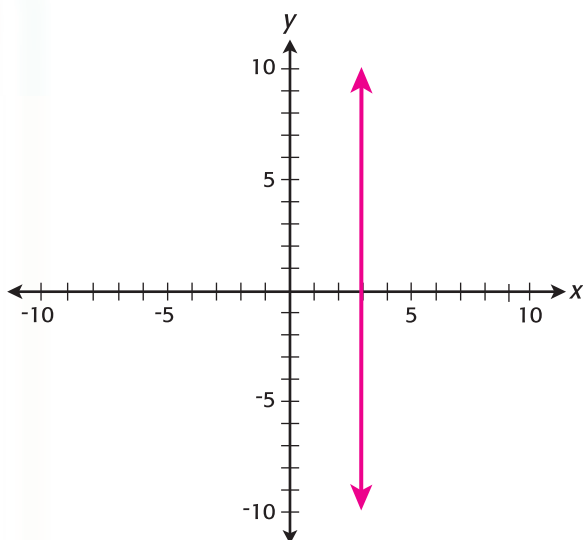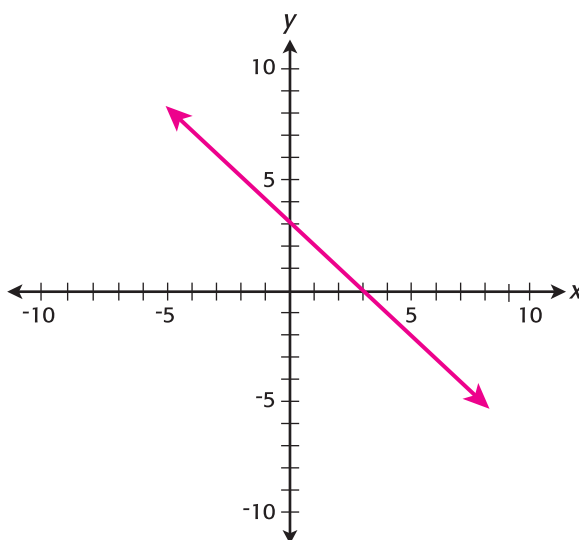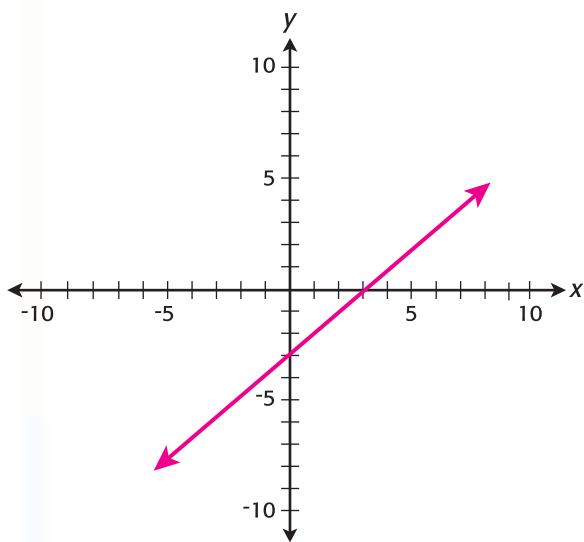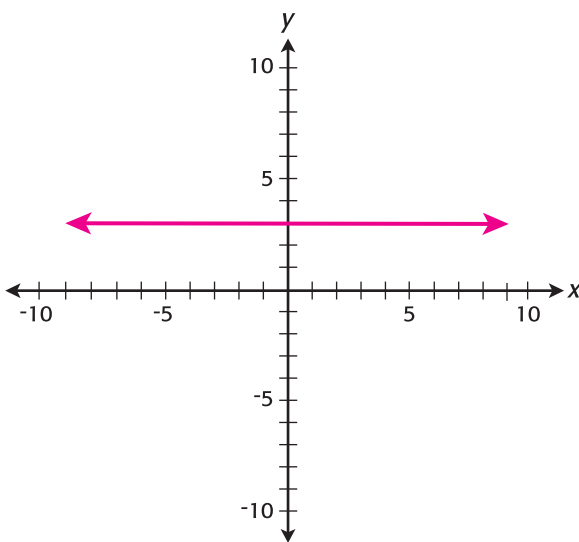Which of the following is equivalent to the expression shown?

$$4x - 5 - 2x - 3$$

A $2x - 8$ **C** $2x + 2$
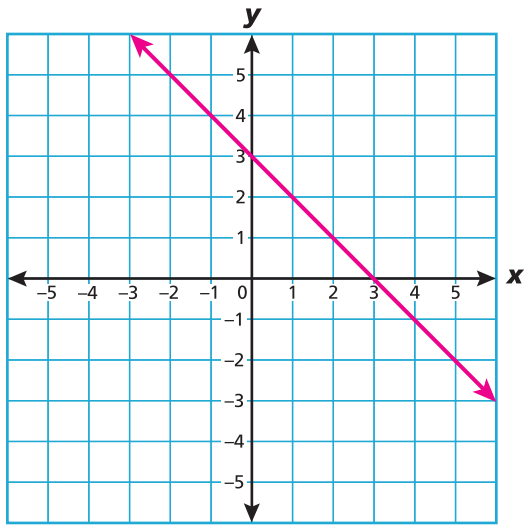**B** $6x + 2$ **D** $6x - 8$

GO ON▶

17

Which represents the graph of $y = 3$?

A

C

B

D

18

Which equation best represents the line shown on this graph?

A $y = x + 3$
B $y = {}^-x + 3$
C $y = 3x$
D $y = {}^-3x$

19

Which of the following equations represents the relationship between x and y in the table?

x	y
0	2
1	5
2	8
3	11
4	14

A $y = 2x$
B $y = x + 2$
C $y = 5x$
D $y = 3x + 2$

20

The graph of a line contains the points (5, 3) and (5, $^-$1).

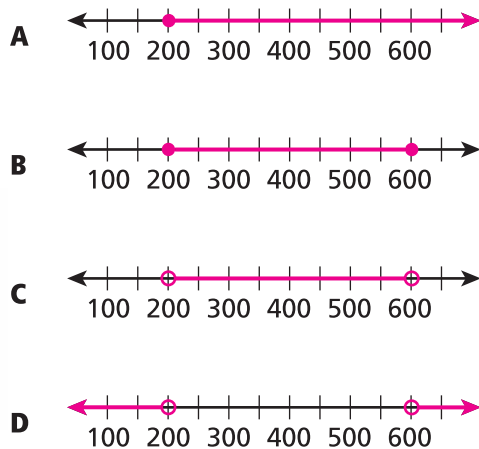Which of the following *must* be true about the graph of this line?

A   The line intersects the *x*-axis.
B   The slope of the line is negative.
C   The line intersects the *y*-axis.
D   The slope of the line is positive.

GO ON▶

21

A single round-trip plane ticket from Illinois to Florida costs between $200 and $600, depending on the time of year and the flight chosen.

Which number line best represents this cost?

A

```
←――+――●――+――+――+――+――+――→
   100 200 300 400 500 600
```

B

```
←――+――●――+――+――+――●――+――→
   100 200 300 400 500 600
```

C

```
←――+――○――+――+――+――○――+――→
   100 200 300 400 500 600
```

D

```
←――+――○――+――+――+――○――+――→
   100 200 300 400 500 600
```

22

The inequality $70° < x < 80°$ represents the range of the ideal water temperature, in degrees Fahrenheit, for Sammy's fish.

Which statement is true about the situation?

A   The ideal water temperature is less than 70 °F.
B   The ideal water temperature is greater than 80 °F.
C   The ideal water temperature is between 70 °F and 80 °F.
D   The ideal water temperature is less than 70 °F or greater than 80 °F.

23

Juan had a checking account with a balance of x dollars. After he withdrew y dollars, he had a balance of $100.

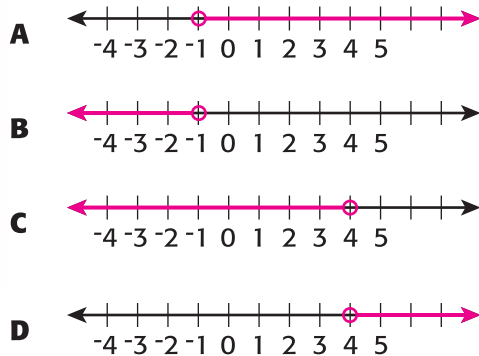Which of the following shows the correct relationship between x, y, and $100?

A $x - y = \$100$
B $\$100 < x - y$
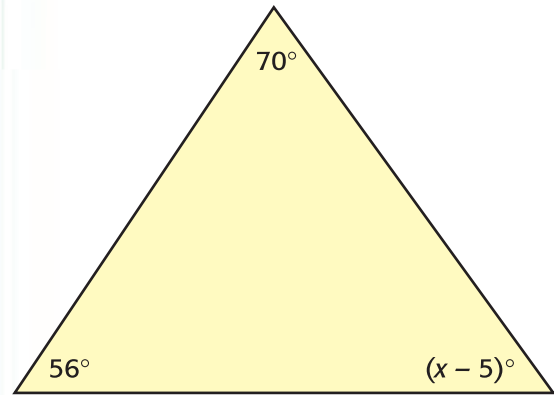**C** $x + y = \$100$
D $x - y > \$100$

GO ON▶

24

Which graph best represents the solution to the inequality below?

$$^-4x + 10 < {}^-6$$

A
-4 -3 -2 -1 0 1 2 3 4 5

B
-4 -3 -2 -1 0 1 2 3 4 5

C
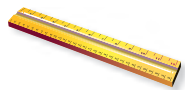-4 -3 -2 -1 0 1 2 3 4 5

D
-4 -3 -2 -1 0 1 2 3 4 5

25

Malia has $1\frac{1}{2}$ times as many tennis balls as Jolie. Together they have 20 tennis balls. How many tennis balls does Malia have?

8	10	12	15
A	**B**	**C**	**D**

26

What is the value of x in the triangle shown?

70°

56° $(x - 5)°$

24	49	54	59
A	**B**	**C**	**D**

27
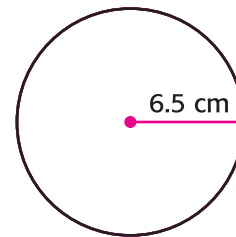
6.5 cm

What is the circumference of this circle in terms of π?

A 65π cm   **C** 13π cm
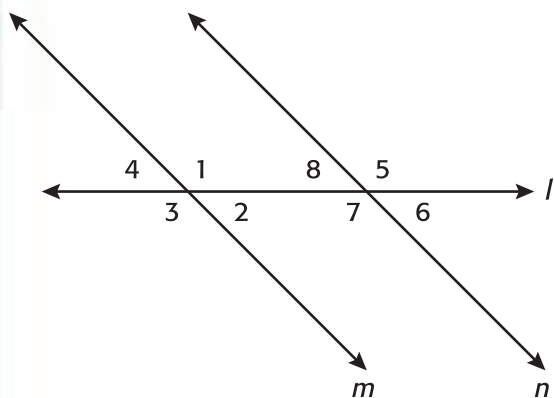**B** 42.25π cm   **D** 6.5π cm

GO ON ▶

28

Which of the following ordered pairs is located in Quadrant II?

A (⁻3, ⁻6)　　**C** (3, 6)
B (⁻3, 6)　　**D** (3, ⁻6)

29
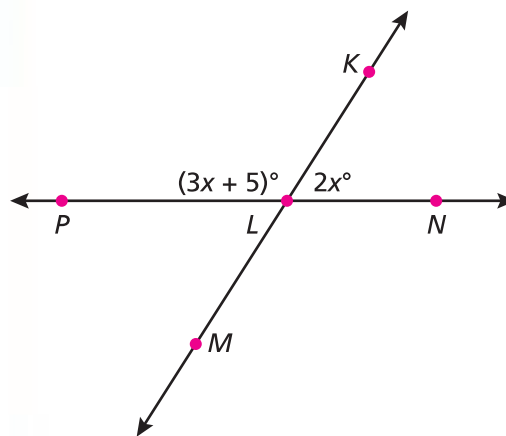
Line *l* intersects parallel lines *m* and *n* as shown.

Which list contains all the angles that are congruent to ∠1?

A ∠3, ∠5, ∠7
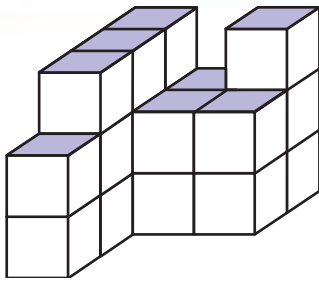**B** ∠3, ∠6, ∠8
C ∠2, ∠3, ∠4
D ∠2, ∠7, ∠8

30

The diagram shows $\overleftrightarrow{PN}$ and $\overleftrightarrow{KM}$ intersecting at point *L*.

What is the measure of ∠*KLN*?
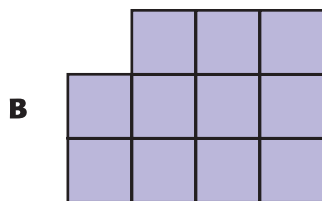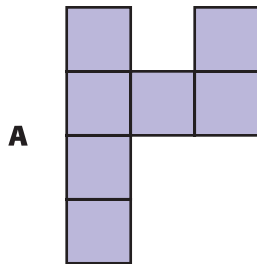
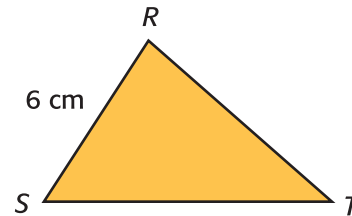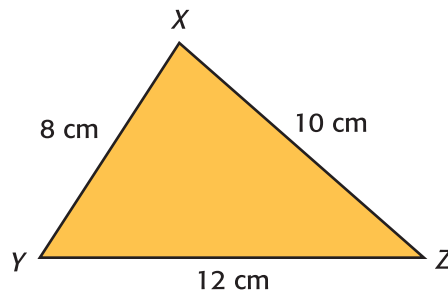| 17°	35°	70°	110°
A	**B**	**C**	**D**

31

Which drawing represents the top view of this solid?

A

B

C

D

32
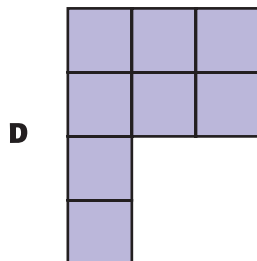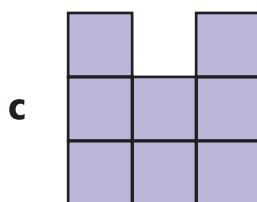
ΔXYZ is similar to ΔRST.

What is the length of $\overline{ST}$?

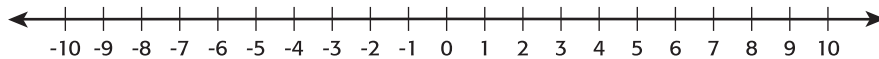| 10 cm	9 cm	8.5 cm	7.5 cm
A	**B**	**C**	**D**

33

The following pairs of numbers can be graphed on this number line.
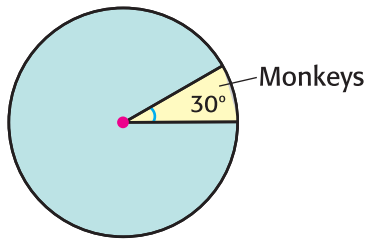
Which numbers have the same absolute value?

A ⁻3 and 3
B   5 and 10
C   4 and ⁻8
D ⁻2 and ⁻4

GO ON ▶

34

The circle graph below represents a total of 240 animals at a zoo. The shaded sector represents the number of monkeys at this zoo.

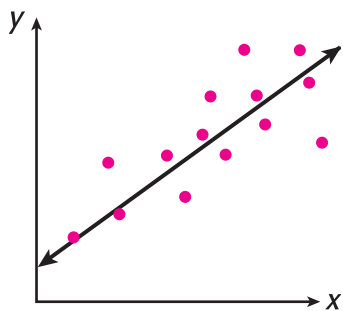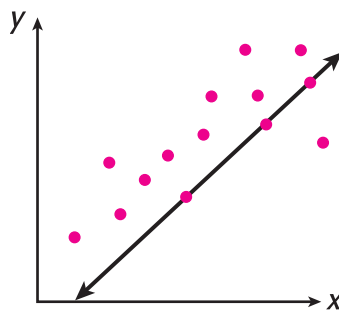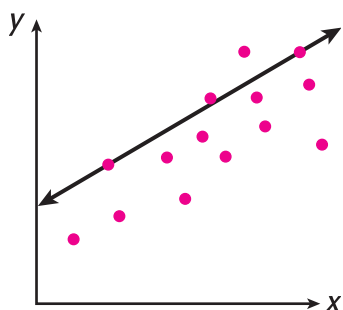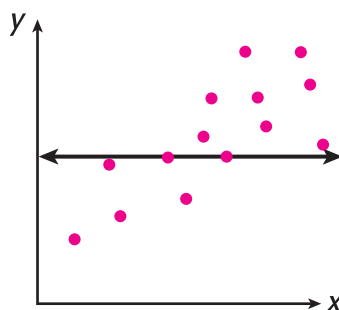**240 Animals at a Zoo**

Monkeys

30°

How many monkeys are at this zoo?

8	20	30	72
A	**B**	**C**	**D**

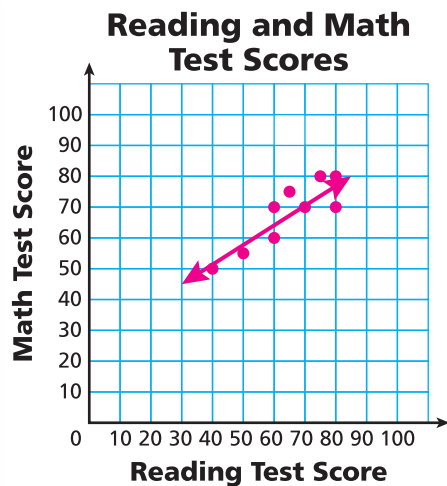**35**

Which scatter plot shows the line that best fits the data points given?

A

C

B

D

36

The scatter plot shows the math and reading test scores of nine students.

Reading and Math Test Scores

Based on the line of best fit, which is the best prediction for a reading test score when a student's math test score is 90?

85	90	95	100
A	B	C	D

37

Mike has only 2 red apples and 3 green apples in a bowl. Without looking he chooses an apple and gives it to his sister. Then he chooses an apple for himself.

What is the probability that he and his sister will each get a red apple?

10%	30%	40%	60%
A	B	C	D

38

The picture below shows both sides of a nickel when landing heads up or tails up.
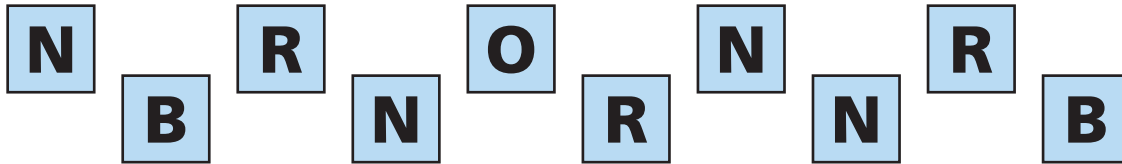

Heads Up   Tails Up

If Billy tosses the nickel three times, what is the probability of the nickel landing tails up on all three tosses?

$\dfrac{1}{8}$	$\dfrac{1}{6}$	$\dfrac{1}{4}$	$\dfrac{1}{2}$
A	B	C	D

GO ON ▶

39

The square letter tiles shown below are placed in an empty box. The tiles are equal in size.

N B R N O R N N R B

If two tiles are randomly selected *without replacement,* what is the probability that the first tile will be the letter R and the second tile will be the letter N?

$\frac{3}{25}$ $\frac{2}{15}$ $\frac{7}{15}$ $\frac{7}{10}$

A   B   C   D

GO ON ▶

40

The student council is making snack bags for a class trip. Each snack bag will contain:

- 1 type of drink
- 1 type of cookie
- 1 type of fruit

To make each snack bag, they will choose from 2 types of drinks, 4 types of cookies, and 2 types of fruit.

> How many combinations of 1 type of drink, 1 type of cookie, and 1 type of fruit are possible?

A   3
B   8
C   16
D   48

41

> Which equation has exactly one solution?

A $7(x - 2) = 7x - 1$

B $7(x - 2) = 7x - 14$

C $7(x + 8) = 7x - 1$

D $7(x + 8) - x = 7x - 1$

42

> Which function is *not* linear?

A $y = 7 - \dfrac{x}{4}$

B $y = \dfrac{4}{x} + 7$

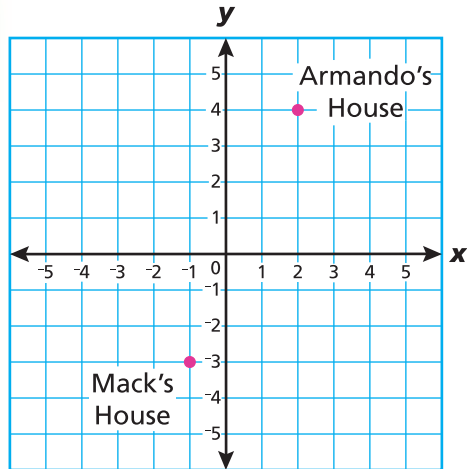**C** $y = 4(x - 2) + 7$

D $y = 7 - 4(x + 2)$

43

> Which function has a graph that is linear?

A $y = \dfrac{x}{3} - 2$

B $y = \dfrac{3}{x} - 2$

C $y = |3x - 2|$

D $y = 3x^2 - 2$

GO ON▶

44

The coordinate grid shows Mack's house and Armando's house.

Each ⊢ represents 1 kilometer.

Which measure is closest to the straight-line distance in kilometers between Mack's house and Armando's house?

A 10.0 km

B   8.0 km

C   7.6 km

D   6.7 km

45

An ice-cream cone has a radius of 1.25 inches and a height of 5 inches.

Which measure is closest to the volume in cubic inches of the ice-cream cone? (Use 3.14 for π.)

A   6.54 in^3

B   8.18 in^3

C   9.39 in^3

D 13.08 in^3

STOP ■