Student Name _____

Teacher Name _____

School _____

System _____

TENNESSEE

Tennessee Comprehensive Assessment Program
Achievement Test ~ Grade 8
## Item Sampler
Version B

Mathematics

1 During a 4-hour drive, a truck driver traveled at a rate of 40 miles per hour for the first hour and 70 miles per hour for the following 3 hours. Which is closest to the average rate the truck driver traveled during these 4 hours?

$$\text{distance} = \text{rate} \times \text{time}$$

A   63.3 miles per hour

B   62.5 miles per hour

C   55.0 miles per hour

D   47.5 miles per hour

2 The graph below represents the temperature inside an oven over a period of time.
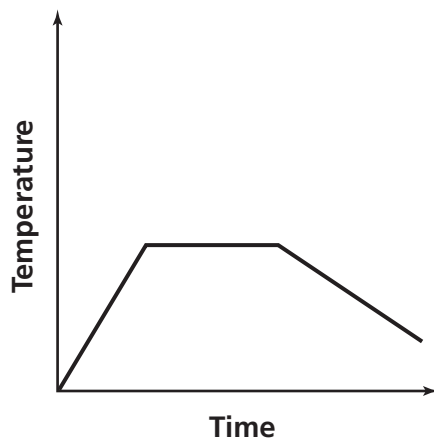
Which statement best describes the change in temperature?

F The temperature increased and then decreased.

G The temperature was constant and then decreased.

H The temperature increased, remained constant, and then decreased.

J The temperature increased, decreased for a while, and then remained constant.

Reporting Category:	1 Mathematical Processes
Performance Indicator:	0806.1.3 Calculate rates involving cost per unit to determine the best buy.

3 Sasha is trying to find the best price for blank CDs. The table below shows the packages of CDs available to purchase.

CD Packages

| Package	Number of CDs	Price
Q	20	$4.10
R	35	$6.50
S	60	$12.50
T	80	$15.99

Which package offers the lowest price per CD?

A Package Q

B Package R

C Package S

D Package T

Reporting Category:	**2 Number and Operations**
Performance Indicator:	**0806.2.1 Order and compare rational and irrational numbers and locate on the number line.**

4 Which value could be represented by a point between the labeled numbers on the number line below?
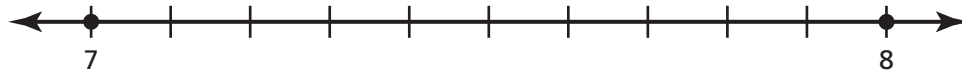
F $\sqrt{48}$

G $\dfrac{39}{6}$

H $\sqrt{56}$

J $\dfrac{74}{9}$

Reporting Category:	**2 Number and Operations**
Performance Indicator:	**0806.2.2 Identify numbers and square roots as rational or irrational.**

5 Which statement is <u>true</u>?

A The number $\dfrac{5}{8}$ is rational.

B The number $\sqrt{\pi}$ is rational.

C The number $\dfrac{\sqrt{5}}{\sqrt{20}}$ is irrational.

D The number 0.625 is irrational.

Reporting Category:	2 Number and Operations
Performance Indicator:	0806.2.3 Use scientific notation to compute products and quotients.

6 Simplify:

$$(1.7 \times 10^2)(2 \times 10^6)$$

- **F** 3.7×10^{12}
- **G** 3.4×10^{12}
- **H** 3.7×10^8
- **J** 3.4×10^8

Reporting Category:	2 Number and Operations
Performance Indicator:	0806.2.4 Solve real-world problems requiring scientific notation.

7 One proton has a charge of approximately 1.6×10^{-19} coulomb. Based on this information, how many protons are required to have a total charge of 4×10^{-2} coulomb?

- **A** 6.4×10^{17}
- **B** 2.5×10^{17}
- **C** 2.5×10^{-21}
- **D** 6.4×10^{-21}

Go On ▶

Reporting Category:	**3 Algebra**
Performance Indicator:	**0806.3.1 Find solutions to systems of two linear equations in two variables.**

8 What is the value of x in the solution to this system of linear equations?

$$4x - 3y = 3$$
$$x - y = 2$$

F -5

G -3

H   3

J   5

Reporting Category:	**3 Algebra**
Performance Indicator:	**0806.3.2 Solve the linear equation f(x) = g(x).**

9 Given the equations below, what is the value of x when $f(x) = g(x)$?
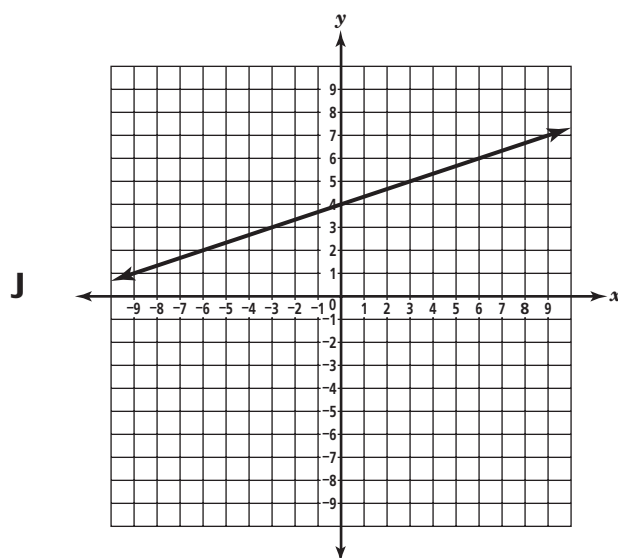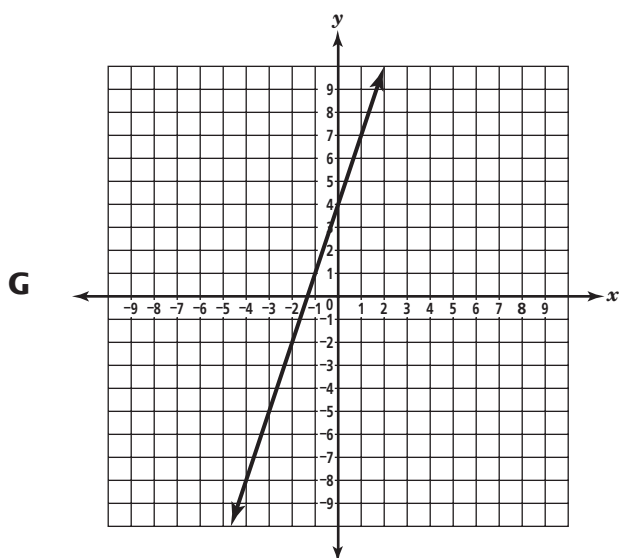
$$f(x) = 3(x - 2)$$
$$g(x) = 0.5(4x - 8)$$

A -10

B -6

C -2
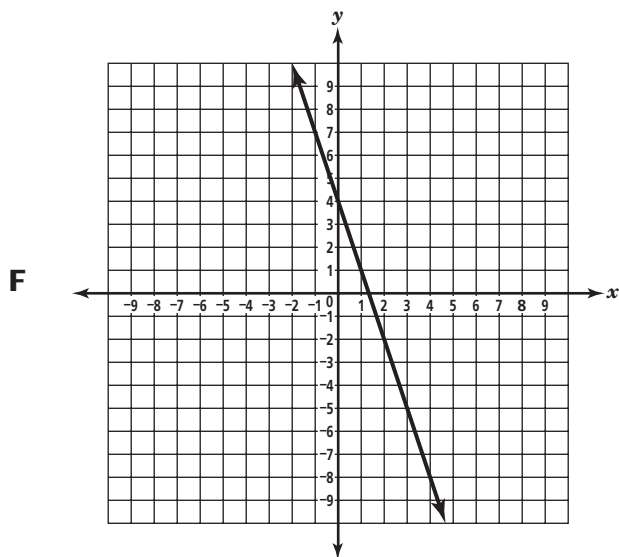
D   2

Reporting Category: 3 Algebra

Performance Indicator: 0806.3.4 Translate between various representations of a linear function.

10 Which graph best represents the equation $y = 3x + 4$?

F

H

G

J

Reporting Category: **3 Algebra**
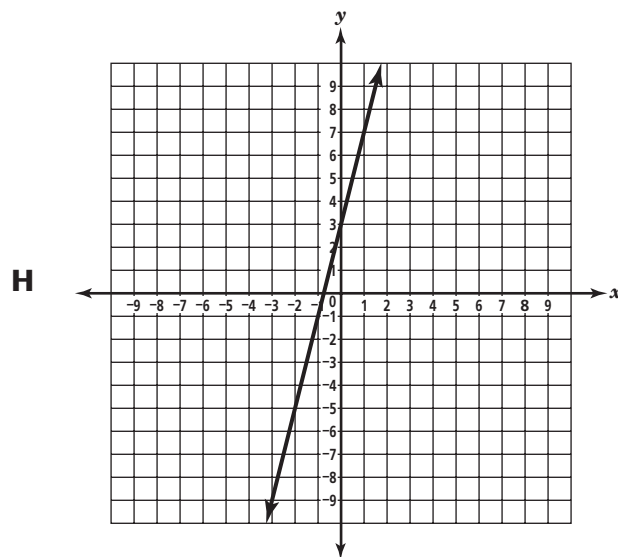
Performance Indicator: **0806.3.5 Determine the slope of a line from an equation, two given points, a table or a graph.**

11   What is the slope, m, of the line represented by the table below?

x	y
−12	−4
−9	−3
−6	−2
0	0
3	1
6	2

$$m = \frac{(y_2 - y_1)}{(x_2 - x_1)}$$

A   −3
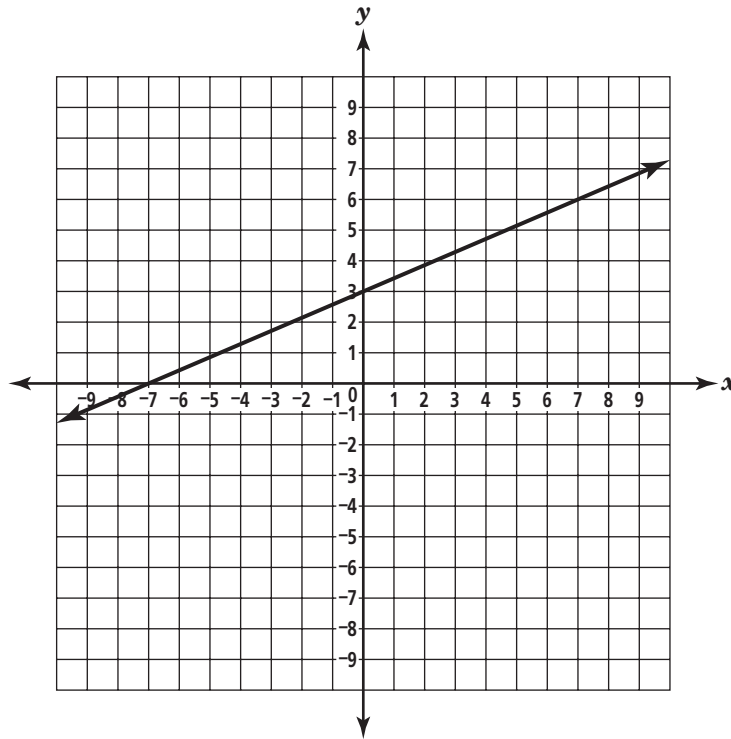
B $-\dfrac{1}{3}$

C $\dfrac{1}{3}$

D   3

12   A function is graphed below.

What appears to be the *x*-intercept of this function?

F $(-7, 0)$

G $(0, -7)$

H $(0, 3)$

J $(3, 0)$

Go On ▶

Reporting Category:	3 Algebra
Performance Indicator:	**0806.3.7 Identify, compare and contrast functions as linear or nonlinear.**

13 Which term in this function identifies it as nonlinear?

$$f(x) = x^3 + \frac{1}{4}x - \sqrt{5}$$

A $-\sqrt{5}$

B $\frac{1}{4}x$

C $f(x)$

D x^3

Reporting Category:	4 Geometry and Measurement
Performance Indicator:	**0806.4.1 Use the Pythagorean Theorem to solve contextual problems.**

14 The rectangular bottom of a box has an interior length of 19 inches and an interior width of 14 inches. A stick is placed in the box along the diagonal of the bottom of the box. Which measurement is closest to the longest possible length for the stick?
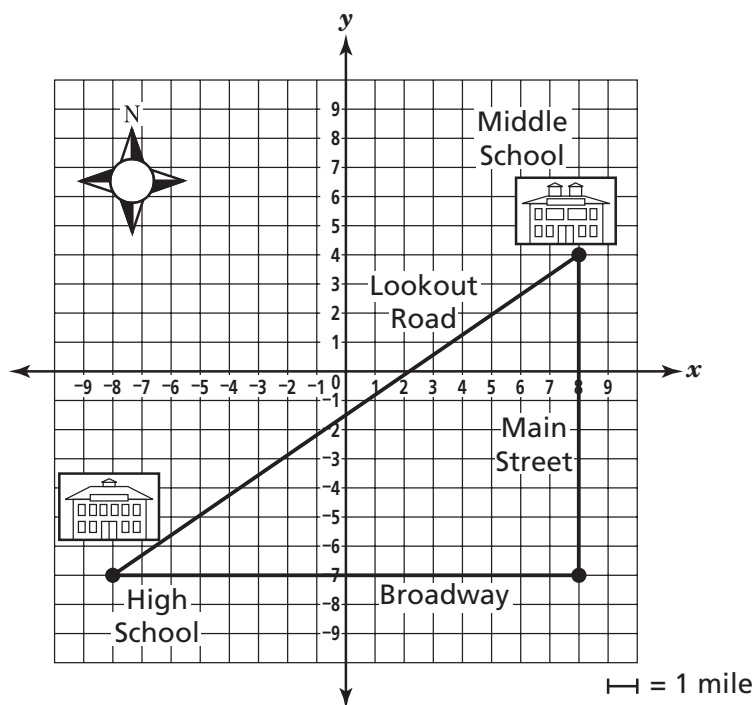
$$a^2 + b^2 = c^2$$

F 12.8 in.

G 16.3 in.

H 23.6 in.

J 33.0 in.

Reporting Category:	**4 Geometry and Measurement**
Performance Indicator:	**0806.4.2 Apply the Pythagorean theorem to find distances between points in the coordinate plane to measure lengths and analyze polygons and polyhedra.**

15 The diagram below shows the locations of two schools on a map. The length of each grid square represents one mile.
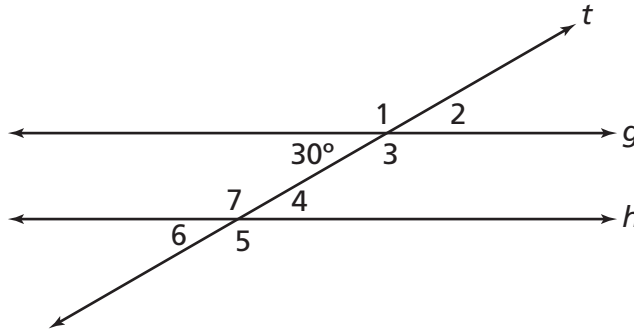

$$a^2 + b^2 = c^2$$

- One route from the high school to the middle school requires traveling northeast on Lookout Road.
- A different route from the high school to the middle school requires traveling east on Broadway and then north on Main Street.

What is the approximate difference between these routes?

A 7.6 miles

B 11.0 miles

C 19.4 miles

D 27.0 miles

Performance Indicator: **0806.4.3 Find measures of the angles formed by parallel lines cut by a transversal.**
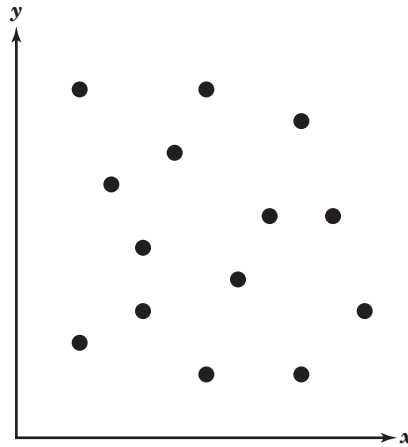
16 Lines *g* and *h* are parallel lines cut by Transversal *t*, as shown in the figure below.

What is the measure of Angle 5?

F 30°

G 60°

H 150°

J 210°

Reporting Category:	5 Data Analysis, Statistics, and Probability
Performance Indicator:	0806.5.3 Generalize the relationship between two sets of data using scatterplots and lines of best fit.

17 Which type of relationship is best represented in the scatterplot below?

A   constant correlation

B   negative correlation

C   positive correlation

D   no correlation

Reporting Category:	5 Data Analysis, Statistics, and Probability
Performance Indicator:	0806.5.4 Recognize misrepresentations of published data in the media.

18 The owner of a dance studio claims that her studio offers more individual attention to students than other studios because the ratio of students to teachers is 8 to 1. The table below shows the daily class sizes at this studio.

Daily Class Sizes

Class	Number of Students	Number of Teachers
Monday	10	1
Tuesday	15	1
Wednesday	18	2
Thursday	2	1
Friday	3	1

Which statement best explains why the student-to-teacher ratio used by the owner of the dance studio is misleading?

F The age of each student attending is not given.

G The experience of each teacher is not included in the table.

H Almost half of the classes at the studio have fewer than 8 students per teacher.

J More than half of the classes at the studio have more than 8 students per teacher.

STOP ⬡

Mathematics
Answer Key

1	B		6	J		11	C		16	H
2	H		7	B		12	F		17	D
3	B		8	G		13	D		18	J
4	H		9	D		14	H			
5	A		10	G		15	A			