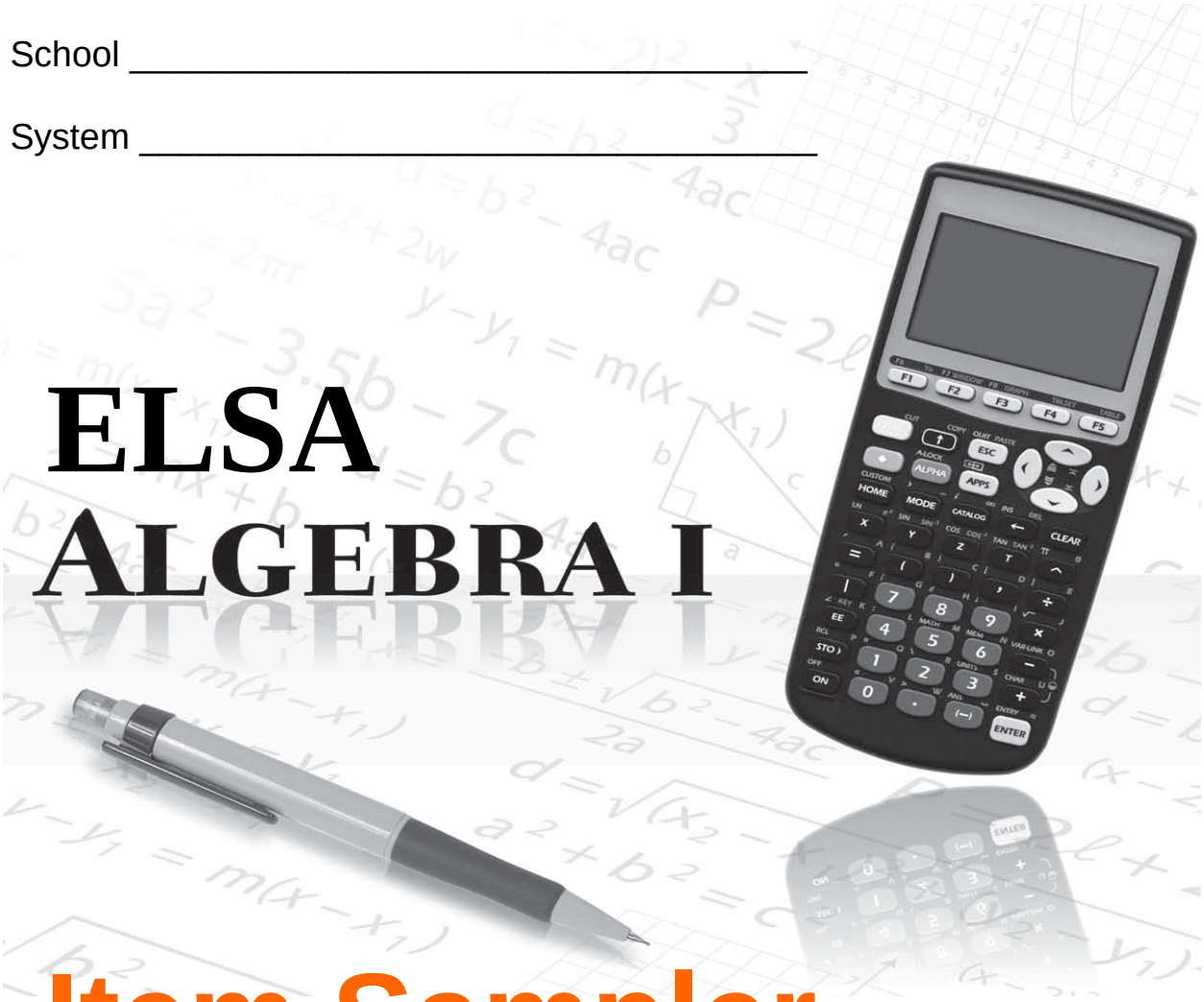
Student Name _____

Teacher Name _____

School _____

System _____



ELSA
ALGEBRA I

Item Sampler

Tennessee End of Course Assessment
English Linguistically Simplified Assessment

Algebra I Form 1

Reporting Category 1: Mathematical Processes

PEARSON

Developed and published under contract with State of Tennessee Department of Education by the Educational Measurement group of Pearson, a business of NCS Pearson, Inc., 2510 North Dodge Street, Iowa City, Iowa 52245. Copyright © 2012 by State of Tennessee Department of Education. All rights reserved. No part of this publication may be reproduced or distributed in any form or by any means, or stored in a database or retrieval system, without the prior written permission of State of Tennessee Department of Education.

Algebra I Reference Page

Abbreviations for Geometric Formulas

A = area	d = diameter	r = radius
B = area of base	h = height	s = length of side
b = base	ℓ = length	V = volume
C = circumference	P = perimeter	w = width

Perimeter (P) and Circumference (C)

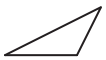
Any Polygon: P = sum of side lengths

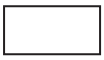
Rectangle: $P = 2\ell + 2w$

Circle: $C = 2\pi r$ or πd

$\pi \approx 3.14$ or $\frac{22}{7}$

Plane Figures — Area (A)

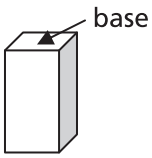
Triangle:  $A = \frac{1}{2}bh$

Rectangle:  $A = \ell w$

Circle: $A = \pi r^2$

$\pi \approx 3.14$ or $\frac{22}{7}$

Solid Figures — Volume (V)

Right Rectangular Prism 

$V = Bh$ or $V = \ell wh$

Cube $V = s^3$

Algebraic Formulas and Equations

$d = rt$ — distance = rate × time

Distance Formula: $d = \sqrt{(x_2 - x_1)^2 + (y_2 - y_1)^2}$

d = distance between two points

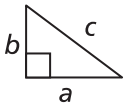
Midpoint Formula: $\left(\frac{x_1 + x_2}{2}, \frac{y_1 + y_2}{2}\right)$

Slope Formula: $m = \frac{y_2 - y_1}{x_2 - x_1}$

Standard Form of a Linear Equation: $Ax + By = C$

Slope-Intercept Equation: $y = mx + b$

Point-Slope Equation: $y - y_1 = m(x - x_1)$

Pythagorean Theorem: $a^2 + b^2 = c^2$ 

Quadratics

For $ax^2 + bx + c = 0$: $x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$

Discriminant: $b^2 - 4ac$

Measurement Conversions

LENGTH

1 foot (ft) = 12 inches (in.)
1 yard (yd) = 3 feet
1 yard = 36 inches
1 mile = 1,760 yards
1 mile = 5,280 feet

CAPACITY

1 cup (c) = 8 fluid ounces (fl oz)
1 pint (pt) = 2 cups
1 quart (qt) = 2 pints
1 quart = 4 cups
1 gallon (gal) = 4 quarts

WEIGHT

1 pound (lb) = 16 ounces (oz)
1 ton (T) = 2,000 pounds

CONVERSION BETWEEN CUSTOMARY AND METRIC MEASUREMENT

1 yard = 0.9144 m
1 foot = 0.3048 m
1 inch = 2.54 cm
1 quart = 0.946 L
1 ounce = 28.35 g
1 lb = 0.45 kg

Contents

Introduction to ELSA Algebra I 5
TCAP English Linguistically Simplified Assessment (ELSA).....5
ELSA test questions.....5
Test accommodations 5
Content of End of Course tests.....5
Test development.....5
Test administration 6
Tips for Taking the Test.....7
Preparing for the test.....7
Before the test 7
During the test.....7
Directions for Using the Item Sampler.....8
ELSA Algebra I Item Sampler.....9
Answer Key with Reporting Category and Performance Indicator 29

Introduction to ELSA Algebra I

TCAP English Linguistically Simplified Assessment (ELSA)

The End of Course English Linguistically Simplified Assessment (ELSA) is the End of course Assessment in "simplified" English. It is a multiple-choice test designed to measure student achievement in certain skills in two content areas: Algebra I and English II. The questions in this Item Sampler are examples of items used in the actual test.

ELSA test questions

Questions are written to test student performance in state content standards. The State Content Standards and Performance Indicators were developed by the Tennessee Department of Education. These Standards and Performance Indicators are listed on the State Department of Education Web site at http://www.state.tn.us/education/curriculum.shtml.

Test accommodations

The End of Course English Linguistically Simplified Assessment ELSA may be administered using various procedures that are used during the student's daily educational program. Certain conditions must be met for students to be eligible for Special and English Learner (EL) accommodations.

Content of End of Course tests

The testing program titled the *Tennessee End of Course Assessment* was established to meet the Tennessee mandate for end of course assessments in Tennessee secondary schools. These tests measure the Tennessee State Performance Indicators. Subject areas covered by the end of course assessments include Mathematics, Language Arts, History, and Science.

Test development

For the *Tennessee End of Course Assessment,* a staff of writers – composed both of teachers and professional test developers experienced in each of the content areas – researched and wrote the items. Professional editors and content specialists carefully reviewed all items and test directions for content and accuracy. To provide a large pool of items for final test selection, the test developers created approximately twice as many items as were needed in the final editions of the tests.

After tryout tests were administered, student responses were analyzed. Professional content editors and researchers carefully reviewed items, their data, and test directions for content, suitability, and accuracy before including certain items and test directions in operational tests.

Test administration

Tennessee End of Course Assessments are given to students as they near the end of courses that are included in the program. Students who are Limited English Proficient (LEP) will be tested using the ELSA test form. Tests may be given midyear for block schedules or at the end of the school year.

You will have ample time to read and answer each of the questions. The ELSA Algebra I test has been designed to be administered in one session and is not timed.

Calculator use is optional. Sharing calculators during testing is not permitted.

The following types of calculators/devices may **NOT** be used during the test:

- pocket organizers
- electronic writing pads or input devices
- Some examples of prohibited calculators are:
    - Casio models: CFX-9970G, Algebra FX 2.0
    - Hewlett-Packard models: HP-40G, HP-49G
    - Texas Instruments models: TI-89, TI-92, Voyage 200, TI-NSPIRE – the CAS version (The non-CAS version of TI-NSPIRE is allowable.)
- calculators that can communicate (transfer data or information) wirelessly with other student calculators/devices
- cell phones, PSPs, and/or iPods
- Students may use any four-function, scientific, or graphing calculator does not have any of the above features. The use of units that have a Computer Algebra System (CAS) is NOT allowed.

Tips for Taking the Test

Preparing for the test

- Take this Practice Test several times
- Review the Tennessee ELSA End of Course Item Sampler for Algebra I located at http://tennessee.gov/education/assessment/sec_samplers.shtml on the Tennessee Department of Education Web site.
- Become familiar with the correct way to mark answers on the answer sheet.

Before the test

- Get a good night's sleep. To do your best, you need to be rested.

During the test

- Relax. It is normal to be somewhat nervous before the test. Try to relax and not worry.
- Listen. Listen to and read the test directions carefully. Ask for an explanation of the directions if you do not understand them.
- Plan your time. Do not spend too much time on any one question. If a question seems to take too long, skip it and return to it later. First answer all questions that you are sure about.
- Think. If you are not sure how to answer a question, read it again and try your best to answer the question. Rule out answer choices that you know are incorrect and choose from those that remain.

Directions for Using the Item Sampler

This Item Sampler for ELSA Algebra I provides specific information to students and teachers. It contains examples of different item types for each Performance Indicator that may be tested in any given end of course test administration. Performance Indicators have been grouped by Reporting Categories. These Reporting Categories will be used to report information regarding performance on the end of courts test to students, teachers, schools, and systems.

The items in this Item Sampler will not be found in the end of course tests. The number of items in this Item Sampler does not reflect the emphasis of content on the test. In order to identify the emphasis of content, the ELSA End of Course Assessment Practice Test for Algebra I should be used. The Practice Test gives a better representation of content emphasis across Reporting Categories and Performance Indicators.

An Answer Key is located in Page 29. Use it to check your answers. Review items that you get wrong.

Reporting Category: Mathematical Processes

Numbers 1 through 40

Performance Indicator: 3102.1.1 Interpret patterns found in sequences, tables, and other forms of quantitative information using variables or function notation.

1. **The table shows the amount of time, in minutes, a printer takes to print pages.**

Printing Time

Time (minutes)	Number of Pages
2	26
4	52
6	78
8	104
10	130

The printer continues to print at the same rate. How long does the printer take to print exactly 247 pages?

- **A** 17 minutes
- **B** 19 minutes
- **C** 20 minutes
- **D** 25 minutes

Performance Indicator: 3102.1.1 Interpret patterns found in sequences, tables, and other forms of quantitative information using variables or function notation.

2. **Karen examines the sequence made by toothpick squares. She concludes that it follows the rule $f(n) = 8n - 4$, where n represents the position of the figure in the sequence and $f(n)$ represents the total number of toothpicks in each figure.**

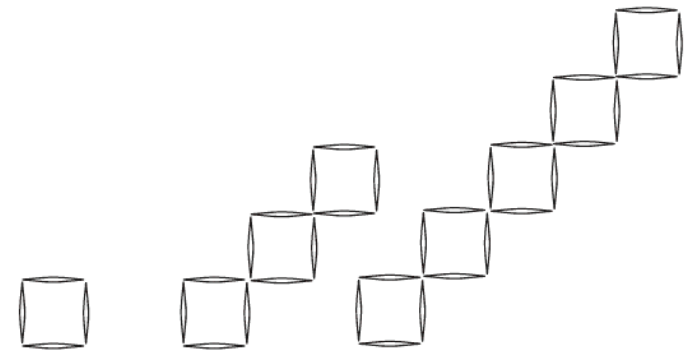


Figure 1 **Figure 2** **Figure 3**

What is the total number of toothpicks in Figure 4 and Figure 5 respectively?

- **A** 28, 36
- **B** 28, 32
- **C** 32, 40
- **D** 36, 44

Go On ▶

Performance Indicator: 3102.1.1 Interpret patterns found in sequences, tables, and other forms of quantitative information using variables or function notation.

3. **Which table best describes the function $f(x) = 5x - 2$?**

A

x	$f(x)$
1	7
2	12
3	17
4	22

C

x	$f(x)$
1	3
2	8
3	13
4	18

B

x	$f(x)$
1	3
2	1
3	−1
4	−3

D

x	$f(x)$
1	7
2	9
3	11
4	13

Performance Indicator: 3102.1.2 Write an equation symbolically to express a contextual problem.

4. **A waiter makes $8 per hour plus 10% of the total amount his customers spend. Which equation shows how much he earns, *e*, if he works *h* hours and his customers spend $990?**

- **A** $e = 0.8h + 990$
- **B** $e = 0.8h + 99$
- **C** $e = 8h + 99$
- **D** $e = 8h + 990$

Go On ▶

Performance Indicator: 3102.1.2 Write an equation symbolically to express a contextual problem.

5. **Vanessa's coffeemaker fills a 1-ounce cup in 30 seconds. Which equation can be used to show how much time, *t*, in minutes the coffeemaker takes to fill an 11-ounce mug?**

- **A** $11(0.5) = t$
- **B** $\frac{11}{t} = 0.5$
- **C** $11(30) = t$
- **D** $\frac{11}{t} = 30$

Performance Indicator: 3102.1.3 Apply properties to evaluate expressions, simplify expressions, and justify solutions to problems.

6. **What is the value of the expression $y - \frac{xz}{3} + \frac{yz^3}{4}$, when $x = 3$, $y = -8$, and $z = -\frac{1}{2}$?**

- **A** $-\frac{31}{4}$
- **B** $-\frac{29}{4}$
- **C** $-\frac{7}{4}$
- **D** $-\frac{5}{4}$

Go On ▶

Performance Indicator: 3102.1.3 Apply properties to evaluate expressions, simplify expressions, and justify solutions to problems.

7. **The table below shows the water park attendance for two days. The cost of admission is $19.95 per person.**

Water Park Attendance

Day	Attendance
Friday	180
Saturday	360

Two methods can be used to find how much money was made on Saturday.

Method 1: Double the attendance on Friday and multiply that amount by the price of one ticket:
$(2 \times 180) \times \$19.95$.

OR

Method 2: Multiply the attendance on Friday by the price of one ticket and double the amount:
$(180 \times \$19.95) \times 2$.

Which two properties justify that both methods will give the same answer?

- **A** multiplicative identity and associative properties
- **B** additive identity and associative properties
- **C** distributive and commutative properties
- **D** associative and commutative properties

Performance Indicator: 3102.1.3 Apply properties to evaluate expressions, simplify expressions, and justify solutions to problems.

8. **If $x = \frac{2t^3}{3}$ and $y = t - 1$, what is the value of the expression $\frac{4}{9}x + y^2$, when $t = 0.3$?**

- **A** 0.508
- **B** 0.498
- **C** −0.472
- **D** −0.482

Go On ▶

Performance Indicator: 3102.1.3 Apply properties to evaluate expressions, simplify expressions, and justify solutions to problems.

9. **Evaluate** $\frac{m^2+2n}{-2} + 4mn$ **for** $m = 2$ **and** $n = -3$.

- **A** -23
- **B** -19
- **C** 19
- **D** 23

Performance Indicator: 3102.1.3 Apply properties to evaluate expressions, simplify expressions, and justify solutions to problems.

10. **Simplify:** $2s^2(s^4 + 2t) - 5(2s^6 + 3t^2 - 3s^2t)$

- **A** $2s^8 - 10s^6 - 3s^2t + 3t^2 + 2t$
- **B** $2s^8 - 10s^6 + 19s^2t - 15t^2$
- **C** $-8s^6 - 3s^2t + 3t^2 + 2t$
- **D** $-8s^6 + 19s^2t - 15t^2$

Go On ▶

Performance Indicator: 3102.1.4 Translate between representations of functions that depict real-world situations.

11. **Which example best represents the equation $y = 10x + 7$?**

- **A** the total cost, y, of buying x books for \$17 each
- **B** the total amount earned, y, dog-sitting for x hours at \$10 per hour for 7 dogs
- **C** the total cost, y, of ordering x tiles worth \$10 each with a \$7 shipping charge
- **D** the total amount, y, spent buying x DVDs for \$7 each plus one set of headphones for \$10

Performance Indicator: 3102.1.4 Translate between representations of functions that depict real-world situations.

12. **Jasmine needs 2.5 gallons of paint to cover 875 ft^2 of a wall. She uses the function $p(x) = \frac{x}{350}$ to find x, the area to paint, and $p(x)$, the amount of paint needed. Which table shows this relationship between x and $p(x)$ correctly?**

A

Amount of Paint Needed

Area, x (square feet)	Amount of Paint, $p(x)$ (gallons)
385	1.1
455	1.3
630	1.8
840	2.4

C

Amount of Paint Needed

Area, x (square feet)	Amount of Paint, $p(x)$ (gallons)
350	1.0
250	1.4
175	2.0
125	2.8

B

Amount of Paint Needed

Area, x (square feet)	Amount of Paint, $p(x)$ (gallons)
406	1.4
522	1.8
638	2.2
754	2.6

D

Amount of Paint Needed

Area, x (square feet)	Amount of Paint, $p(x)$ (gallons)
1,050	1.2
1,575	1.8
1,925	2.2
2,100	2.4

Go On ▶

Performance Indicator: 3102.1.4 Translate between representations of functions that depict real-world situations.

13. **Ryan starts with $400 in a bank account. Each week he deposits $100 into the account from his paycheck. If he withdraws $120 from the account each week, which graph can be used to show his account balance?**

A

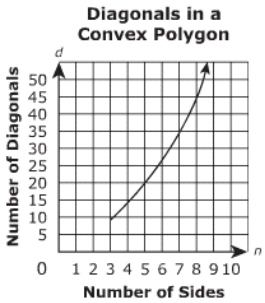
C

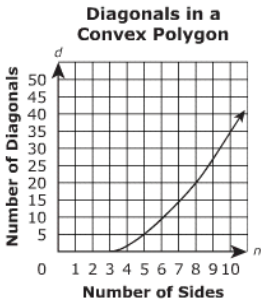
B

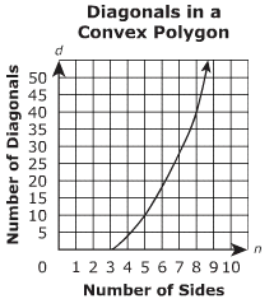
D

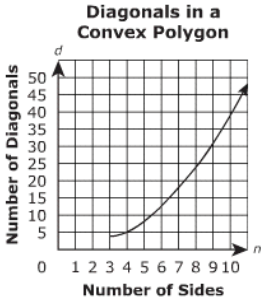
Performance Indicator: 3102.1.4 Translate between representations of functions that depict real-world situations.

14. **The number of diagonals, *d*, that can be drawn in an *n*-sided convex polygon is represented by $d = \frac{n(n-3)}{2}$. Which graph <u>best</u> models this relationship?**

A


C


B


D


Go On ▶

Performance Indicator: 3102.1.4 Translate between representations of functions that depict real-world situations.

15. **A linear equation $y = 2.5x + 60$ represents the total cost, y, of producing x, the number of lunches. Which table represents the equation correctly?**

A

Cost of Box Lunches

Number of Box Lunches, x	Total Cost, y
50	$725.00
75	$787.50
100	$850.00

B

Cost of Box Lunches

Number of Box Lunches, x	Total Cost, y
50	$185.00
75	$247.50
100	$310.00

C

Cost of Box Lunches

Number of Box Lunches, x	Total Cost, y
50	$125.00
75	$187.50
100	$250.00

D

Cost of Box Lunches

Number of Box Lunches, x	Total Cost, y
50	$112.50
75	$137.50
100	$162.50

Performance Indicator: 3102.1.4 Translate between representations of functions that depict real-world situations.

16. **Peter made a table of his charges for shoveling snow on 3 days.**

Shoveling Charges

Day	Amount of Snowfall, a (inches)	Charge, c
Monday	3	$9.00
Tuesday	5	$14.00
Wednesday	7	$19.00

Which equation shows the relationship between the charge, c, and the amount of snowfall, a?

- **A** $c = 3a$
- **B** $c = 2.5a$
- **C** $c = 2.5a + 1.5$
- **D** $c = 1.5a + 2.5$

Go On ▶

Performance Indicator: 3102.1.5 Recognize and express the effect of changing constants and/or coefficients in problem solving.

17. **What happens to the graph of $y = -4x^2$ when the equation becomes $y = 4x^2$?**

- **A** The graph is shifted down.
- **B** The graph is shifted up.
- **C** The graph is reflected over the y axis.
- **D** The graph is reflected over the x axis.

Performance Indicator: 3102.1.6 Determine and interpret slope in multiple contexts including rate of change in real-world problems.

18. **Water boils at 100°C at sea level. If water boils at 80°C at 4 miles above sea level, what is the rate of change of the boiling point of water with respect to the distance above sea level?**

- **A** −20°C per mile
- **B** −5°C per mile
- **C** 5°C per mile
- **D** 20°C per mile

Go On ▶

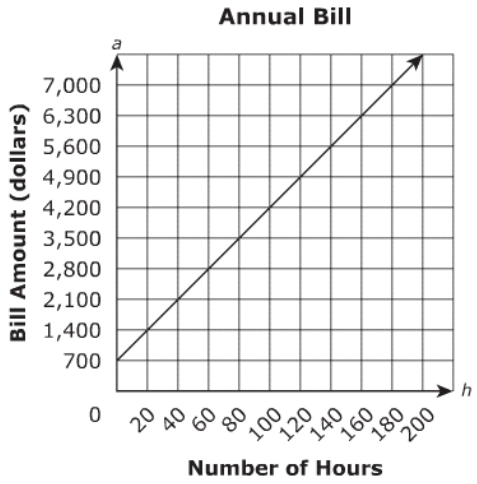
Performance Indicator: 3102.1.6 Determine and interpret slope in multiple contexts including rate of change in real-world problems.

19. **Robert buys 5 baseball cards every month. The equation $y = 75 + 5x$ represents the number of baseball cards that Robert has after x months. What does the slope represent in this situation?**

- **A** the number of months
- **B** the number of baseball cards after x months
- **C** the initial number of baseball cards in Robert's collection
- **D** the number of baseball cards Robert buys every month

Performance Indicator: 3102.1.6 Determine and interpret slope in multiple contexts including rate of change in real-world problems.

20. **A local gym charges a fixed annual membership fee and an additional charge for each hour, h, spent with a personal trainer. The graph shows the relationship between the bill amount and the number of hours spent with a personal trainer.**



What is the hourly rate charged for the time spent with a personal trainer?

- **A** $30 per hour
- **B** $35 per hour
- **C** $70 per hour
- **D** $105 per hour

Go On ▶

Performance Indicator: 3102.1.1 Interpret patterns found in sequences, tables, and other forms of quantitative information using variables or function notation.

21. **A hot air balloon starts descending after reaching a height of 500 feet. The table shows the height in feet, $f(t)$, of the hot air balloon after t seconds.**

Height of Hot Air Balloon

Time, t (in seconds)	Height $f(t)$ (in feet)
1	486
2	472
3	458
4	444
5	430

Which function best describes the height, $f(t)$, of the hot air balloon after t seconds?

- **A** $f(t) = 486 - 14t$
- **B** $f(t) = 14t - 486$
- **C** $f(t) = 500 - 14t$
- **D** $f(t) = 14t - 500$

Performance Indicator: 3102.1.1 Interpret patterns found in sequences, tables, and other forms of quantitative information using variables or function notation.

22. **The first two terms in a sequence are 10 and 13. The sequence follows the rule $f(x) = 3x + 7$, where x represents the position of the term in the sequence. Which list shows the next five terms in the sequence?**

- **A** 16, 19, 22, 25, 28
- **B** 16, 23, 26, 33, 36
- **C** 20, 23, 30, 33, 40
- **D** 20, 27, 34, 41, 48

Performance Indicator: 3102.1.1 Interpret patterns found in sequences, tables, and other forms of quantitative information using variables or function notation.

23. **The table shows Xavier's earnings, $f(x)$, after working x number of hours.**

Xavier's Earnings

Number of Hours, x	Earnings, $f(x)$
1	$10
2	$18
3	$26
4	$34
5	$42

Which function best describes Xavier's earnings?

- **A** $f(x) = 8x$
- **B** $f(x) = x + 2$
- **C** $f(x) = 8x + 2$
- **D** $f(x) = 2x + 8$

Performance Indicator: 3102.1.2 Write an equation symbolically to express a contextual problem.

24. **At a state fair, Hannah pays $10.00 for the admission fee, $5.00 for parking, and $2 for each ride. Which equation shows the relationship between the total amount Hannah spent, d, in dollars and the number of rides, r?**

- **A** $d = 2r + 5$
- **B** $d = 2r + 15$
- **C** $d = 10r + 7$
- **D** $d = 15r + 2$

Go On ▶

Performance Indicator: 3102.1.2 Write an equation symbolically to express a contextual problem.

25. **An empty box weighs 35 pounds, and the average weight of a watermelon is 18 pounds. Which equation shows how to find how many watermelons, *n*, are in the box if it now weighs 143 pounds?**

- **A** $143 = 18n - 35$
- **B** $143 = 18n + 35$
- **C** $143 = 35n + 18$
- **D** $143 = (18 + 35)n$

Performance Indicator: 3102.1.3 Apply properties to evaluate expressions, simplify expressions, and justify solutions to problems.

26. **Evaluate $\frac{2}{3}xy - x^2y$ for $x = -3$ and $y = -4$.**

- **A** -44
- **B** -28
- **C** 28
- **D** 44

Performance Indicator: 3102.1.3 Apply properties to evaluate expressions, simplify expressions, and justify solutions to problems.

27. **April buys 2 pairs of jeans for $42 each and 2 T-shirts for $14 each. She calculates the total amount by multipying 2 by $56, while the receipt shows the total amount as $84 plus $28. Which property proves that either way can be used to get the same total amount?**

- **A** associative property
- **B** distributive property
- **C** addition property of equality
- **D** multiplication property of equality

Performance Indicator: 3102.1.3 Apply properties to evaluate expressions, simplify expressions, and justify solutions to problems.

28. **Simplify:** $3x(x + 2y) + 4(6 - xy)$

- **A** $3x^2 + 2xy + 24$
- **B** $3x + 2xy + 24$
- **C** $3x^2 - xy + 2y + 24$
- **D** $3x - xy + 2y + 24$

Performance Indicator: 3102.1.4 Translate between representations of functions that depict real-world situations.

29. **The equation $C = 0.1t + 40$ represents the total amount that a cell phone company charges for text messages. Which table shows this relationship correctly between the total charge, C, and the number of text messages, t?**

○ **A**

Total Cell Phone Charges

Number of Text Messages, t	Total Charge, C
5	$45.10
10	$50.10
15	$55.10

○ **B**

Total Cell Phone Charges

Number of Text Messages, t	Total Charge, C
5	$45.00
10	$50.00
15	$55.00

○ **C**

Total Cell Phone Charges

Number of Text Messages, t	Total Charge, C
5	$40.50
10	$41.00
15	$41.50

○ **D**

Total Cell Phone Charges

Number of Text Messages, t	Total Charge, C
5	$40.05
10	$40.10
15	$40.15

Performance Indicator: 3102.1.4 Translate between representations of functions that depict real-world situations.

30. **Shaniqua can buy books for $5 each if she pays to join a book club. The book club fee is $36. Which table shows the amount she will spend to buy n number of books.**

○ **A**

Cost for n Books

Number of Books, n	Cost (dollars)
42	210
45	225
55	275
60	300

○ **B**

Cost for n Books

Number of Books, n	Cost (dollars)
12	96
15	111
23	151
25	161

○ **C**

Cost for n Books

Number of Books, n	Cost (dollars)
12	437
15	545
23	833
25	905

○ **D**

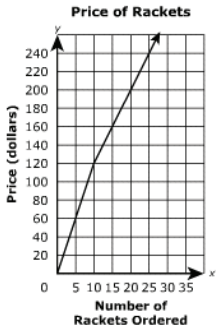
Cost for n Books

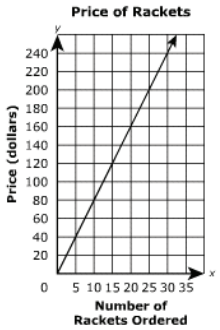
Number of Books, n	Cost (dollars)
42	174
45	189
55	239
60	264

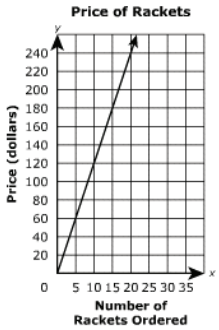
Go On ▶

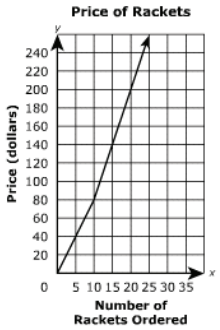
Performance Indicator: 3102.1.4 Translate between representations of functions that depict real-world situations.

31. **Tennis rackets cost $12 each for the first ten rackets. After that they cost $8 each. A store wants to buy tennis rackets to sell. Which graph represents the relationship correctly?**

A


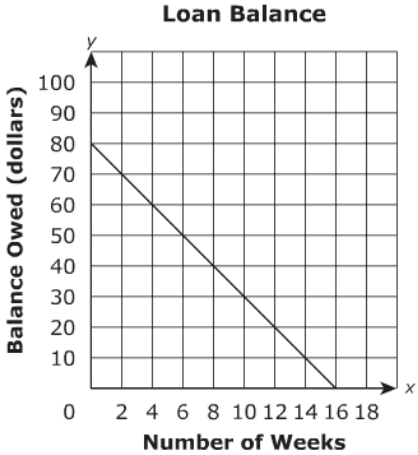
C


B


D


Performance Indicator: 3102.1.4 Translate between representations of functions that depict real-world situations.

32. **Ralph borrowed $80 from his sister. To repay the loan, he pays her weekly. The graph below models the balance, *y*, he owes after *x* weeks of payments.**



Which equation best represents the relationship between the balance owed and the number of weeks?

- A $y = 80 - 10x$
- B $y = 80 - 5x$
- C $y = 80 + 5x$
- D $y = 80 + 10x$

Go On ▶

Performance Indicator: 3102.1.4 Translate between representations of functions that depict real-world situations.

33. **The table shows the amounts three students spent on wire for a science project.**

Wire Cost

Student	Length of the Wire, *w* (feet)	Cost, *c*
Terrance	3	$8.55
Jimmy	5	$14.25
Vanessa	6	$17.10

Which equation represents the relationship between the cost, *c*, and the length of the wire, *w*?

- **A** $c = 11.4w$
- **B** $c = 8.55w$
- **C** $c = 5.7w$
- **D** $c = 2.85w$

Performance Indicator: 3102.1.4 Translate between representations of functions that depict real-world situations.

34. **Which scenario <u>best</u> represents the equation $y = 1.5x + 15$?**

- **A** the profit from selling *x* glasses of lemonade for $1.50 per glass at a fair, if the booth rental is $15
- **B** the total cost to rent skis for *x* hours at $1.50 per hour, including an initial deposit amount of $15
- **C** the amount of gasoline left in a car after traveling *x* minutes, if it initially had 15 gallons of gasoline and used 1.5 gallons per minute
- **D** distance covered by a biker after traveling *x* hours at a constant speed of 15 miles per hour and then traveling 1.5 miles at a different speed

Go On ▶

Performance Indicator: 3102.1.5 Recognize and express the effect of changing constants and/or coefficients in problem solving.

35. **If the slope of the line $y = -4x + 1$ is multiplied by 4, what will happen to its graph?**

- **A** The line will shift up 4 units.
- **B** The line will shift down 4 units.
- **C** The line will become 4 times as steep.
- **D** The line will become $\frac{1}{4}$ as steep.

Performance Indicator: 3102.1.5 Recognize and express the effect of changing constants and/or coefficients in problem solving.

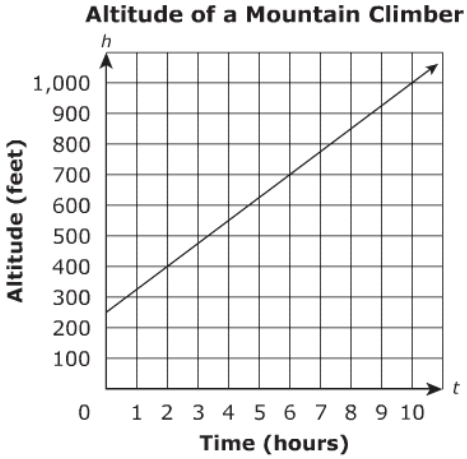
36. **A line is represented by the equation $y = 6x + b$, where b is a positive number. How will the graph change if the value of b is increased by 3 units?**

- **A** The line will shift to the right 3 units.
- **B** The line will shift to the left 3 units.
- **C** The line will shift down 3 units.
- **D** The line will shift up 3 units.

Go On ▶

Performance Indicator: 3102.1.6 Determine and interpret slope in multiple contexts including rate of change in real-world problems.

37. **The graph shows the altitude, *h*, in feet, of a mountain climber after *t* hours.**



What is the mountain climber's average climbing rate?

- **A** 75 feet per hour
- **B** 150 feet per hour
- **C** 250 feet per hour
- **D** 300 feet per hour

Performance Indicator: 3102.1.6 Determine and interpret slope in multiple contexts including rate of change in real-world problems.

38. **Ryan bicycled 100 miles from his home. The table shows his distance, in miles, from home at different times.**

Ryan's Distance from Home

Time (hours)	Distance (miles)
1.5	30
2	40
2.5	50
3	60

What was Ryan's average speed?

- **A** 5 miles per hour
- **B** 10 miles per hour
- **C** 20 miles per hour
- **D** 25 miles per hour

Go On ▶

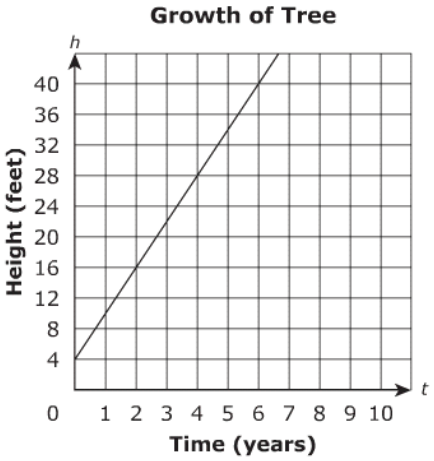
Performance Indicator: 3102.1.6 Determine and interpret slope in multiple contexts including rate of change in real-world problems.

39. **The total amount a daycare charges is represented by the equation $y = 175x + 50$, where y represents the total charge for x weeks. What does the slope represent in this situation?**

- **A** the weekly charge
- **B** the total charge
- **C** the registration fee
- **D** the number of weeks

Performance Indicator: 3102.1.6 Determine and interpret slope in multiple contexts including rate of change in real-world problems.

40. **Lisa planted a tree. The graph shows the height, h, of the tree over a period of t years.**



According to the graph, what is the tree's growth rate?

- **A** 4 feet per year
- **B** 6 feet per year
- **C** 8 feet per year
- **D** 12 feet per year

Reporting Category 1: Mathematical Processes		
Item Number	**Correct Answer**	**Performance Indicator**
1	B	3102.1.1 Interpret patterns found in sequences, tables, and other forms of quantitative information using variables or function notation.
2	A	3102.1.1 Interpret patterns found in sequences, tables, and other forms of quantitative information using variables or function notation.
3	C	3102.1.1 Interpret patterns found in sequences, tables, and other forms of quantitative information using variables or function notation.
4	C	3102.1.2 Write an equation symbolically to express a contextual problem.
5	A	3102.1.2 Write an equation symbolically to express a contextual problem.
6	B	3102.1.3 Apply properties to evaluate expressions, simplify expressions, and justify solutions to problems.
7	D	3102.1.3 Apply properties to evaluate expressions, simplify expressions, and justify solutions to problems.
8	B	3102.1.3 Apply properties to evaluate expressions, simplify expressions, and justify solutions to problems.
9	A	3102.1.3 Apply properties to evaluate expressions, simplify expressions, and justify solutions to problems.
10	D	3102.1.3 Apply properties to evaluate expressions, simplify expressions, and justify solutions to problems.
11	C	3102.1.4 Translate between representations of functions that depict real-world situations.
12	A	3102.1.4 Translate between representations of functions that depict real-world situations.
13	D	3102.1.4 Translate between representations of functions that depict real-world situations.
14	C	3102.1.4 Translate between representations of functions that depict real-world situations.

15	B	3102.1.4 Translate between representations of functions that depict real-world situations.
16	C	3102.1.4 Translate between representations of functions that depict real-world situations.
17	D	3102.1.5 Recognize and express the effect of changing constants and/or coefficients in problem solving.
18	B	3102.1.6 Determine and interpret slope in multiple contexts including rate of change in real-world problems.
19	D	3102.1.6 Determine and interpret slope in multiple contexts including rate of change in real-world problems.
20	B	3102.1.6 Determine and interpret slope in multiple contexts including rate of change in real-world problems.
21	C	3102.1.1 Interpret patterns found in sequences, tables, and other forms of quantitative information using variables or function notation.
22	A	3102.1.1 Interpret patterns found in sequences, tables, and other forms of quantitative information using variables or function notation.
23	C	3102.1.1 Interpret patterns found in sequences, tables, and other forms of quantitative information using variables or function notation.
24	B	3102.1.2 Write an equation symbolically to express a contextual problem.
25	B	3102.1.2 Write an equation symbolically to express a contextual problem.
26	D	3102.1.3 Apply properties to evaluate expressions, simplify expressions, and justify solutions to problems.
27	B	3102.1.3 Apply properties to evaluate expressions, simplify expressions, and justify solutions to problems.
28	A	3102.1.3 Apply properties to evaluate expressions, simplify expressions, and justify solutions to problems.
29	C	3102.1.4 Translate between representations of functions that depict real-world situations.

30	A	3102.1.4 Translate between representations of functions that depict real-world situations.
31	A	3102.1.4 Translate between representations of functions that depict real-world situations.
32	B	3102.1.4 Translate between representations of functions that depict real-world situations.
33	D	3102.1.4 Translate between representations of functions that depict real-world situations.
34	B	3102.1.4 Translate between representations of functions that depict real-world situations.
35	C	3102.1.5 Recognize and express the effect of changing constants and/or coefficients in problem solving.
36	D	3102.1.5 Recognize and express the effect of changing constants and/or coefficients in problem solving.
37	A	3102.1.6 Determine and interpret slope in multiple contexts including rate of change in real-world problems.
38	C	3102.1.6 Determine and interpret slope in multiple contexts including rate of change in real-world problems.
39	A	3102.1.6 Determine and interpret slope in multiple contexts including rate of change in real-world problems.
40	B	3102.1.6 Determine and interpret slope in multiple contexts including rate of change in real-world problems.