

# Tennessee Comprehensive Assessment Program

# TCAP

TNReady—Math  
EOC Item Release





Published under contract with the Tennessee Department of Education by Questar Assessment Inc., 5550 Upper 147th Street West, Minneapolis, MN 55124. Copyright © 2017 by Tennessee Department of Education. No part of this publication may be copied, reproduced, or distributed in any form or by any means, or stored in a database or retrieval system, without the prior express written consent of the Tennessee Department of Education and Questar Assessment Inc. Nextera® is a registered trademark of Questar Assessment Inc. All trademarks, product names, and logos are the property of their respective owners. All rights reserved.

# Table of Contents

---

**Metadata Interpretation Guide – Math** ..... 4

    SAMPLE METADATA TABLE .....4

    METADATA DEFINITIONS.....5

**Math EOC**..... 6

# Metadata Interpretation Guide – Math

---

## SAMPLE METADATA TABLE

<b>Label</b>	TN0045532	<b>Max Points</b>	1
<b>Item Grade</b>	8	<b>Rationale1</b>	
<b>Item Content</b>	Math	<b>Rationale2</b>	
<b>Item Type</b>	Choice	<b>Rationale3</b>	
<b>Key</b>	3	<b>Rationale4</b>	
<b>DOK</b>	2	<b>Rationale5</b>	
<b>Difficulty</b>	M	<b>Rationale6</b>	
<b>Calculator</b>	No	<b>Sample Answer</b>	
<b>Ruler</b>	None		
<b>Standard 1 Code</b>	8.NS.A.2	<b>Standard 1</b>	
<b>Standard 2 Code</b>	8.NS.A.2	<b>Standard 2</b>	

**METADATA DEFINITIONS**

<b>Label:</b> Unique letter/number code used to identify the item.	<b>Max Points:</b> Maximum score points possible for this item.
<b>Item Grade</b> (if listed): Grade level in 3-8 or EOC	<b>Rationale1</b> (if listed): Reason why this answer choice is correct or incorrect.
<b>Item Content</b> (if listed): Subject being tested. (e.g., ELA, Algebra I, etc.).	<b>Rationale2</b> (if listed): Reason why this answer choice is correct or incorrect.
<b>Item Type:</b> For example, "Choice" for multiple choice questions, "Match" for matching tables, "Composite" for two-part items.	<b>Rationale3</b> (if listed): Reason why this answer choice is correct or incorrect.
<b>Key:</b> Correct answer. 1=A, 2=B, etc. This may be blank for constructed response items where students write or type their responses.	<b>Rationale4</b> (if listed): Reason why this answer choice is correct or incorrect.
<b>DOK</b> (if listed): Depth of Knowledge (cognitive complexity) is measured on a four-point scale. 1=recall; 2=skill/concept; 3=strategic thinking; 4=extended thinking.	<b>Rationale5</b> (if listed): Reason why this answer choice is correct or incorrect.
<b>Difficulty</b> (if listed): Level of difficulty.	<b>Rationale6</b> (if listed): Reason why this answer choice is correct or incorrect.
<b>Calculator</b> (if listed): Yes for items that permit calculator use.	<b>Protractor</b> (if listed): Yes for items that permit protractor use.
<b>Ruler</b> (if listed): Yes for items that permit a ruler.	<b>Sample Answer</b> (if listed): An example of an answer a student could provide.
<b>Standard 1 Code</b> (if listed): Content standard assessed.	<b>Standard 1</b> (if listed): Text of the content standard assessed.
<b>Standard 2 Code</b> (if listed): Content standard assessed. This is the primary code used for the Integrated Math courses.	<b>Standard 2</b> (if listed): Text of the content standard assessed.

TN788764

<b>Label</b>	TN788764	<b>Max Points</b>	1
<b>Item Grade</b>	09	<b>Rationale1</b>	N/A
<b>Item Content</b>	Algebra I	<b>Rationale2</b>	N/A
<b>Item Type</b>	choice	<b>Rationale3</b>	N/A
<b>Key</b>	4	<b>Rationale4</b>	N/A
<b>DOK</b>	2	<b>Rationale5</b>	N/A
<b>Difficulty</b>	N/A	<b>Rationale6</b>	N/A
<b>Calculator</b>	No	<b>Sample Answer</b>	N/A
<b>Ruler</b>	None		
<b>Standard 1 Code</b>	N.Q.A.1	<b>Standard 1 Text</b>	N/A

Ostriches can run at a sustained speed of 31 miles per hour.

Which expression would convert this speed to feet per second?

- A  $\left( \frac{31 \text{ miles}}{1 \text{ hour}} \right) \left( \frac{5280 \text{ feet}}{1 \text{ mile}} \right) \left( \frac{1 \text{ hour}}{60 \text{ sec}} \right)$
- B  $\left( \frac{31 \text{ miles}}{1 \text{ hour}} \right) \left( \frac{1 \text{ hour}}{60 \text{ min}} \right) \left( \frac{1 \text{ mile}}{5280 \text{ feet}} \right)$
- C  $\left( \frac{31 \text{ miles}}{1 \text{ hour}} \right) \left( \frac{1 \text{ hour}}{60 \text{ min}} \right) \left( \frac{1 \text{ min}}{60 \text{ sec}} \right) \left( \frac{1 \text{ mile}}{5280 \text{ feet}} \right)$
- D  $\left( \frac{31 \text{ miles}}{1 \text{ hour}} \right) \left( \frac{5280 \text{ feet}}{1 \text{ mile}} \right) \left( \frac{1 \text{ hour}}{60 \text{ min}} \right) \left( \frac{1 \text{ min}}{60 \text{ sec}} \right)$

# TN840137

<b>Label</b>	TN840137	<b>Max Points</b>	1
<b>Item Grade</b>	HS	<b>Rationale1</b>	N/A
<b>Item Content</b>	Math	<b>Rationale2</b>	N/A
<b>Item Type</b>	choice	<b>Rationale3</b>	N/A
<b>Key</b>	3	<b>Rationale4</b>	N/A
<b>DOK</b>	2	<b>Rationale5</b>	N/A
<b>Difficulty</b>	N/A	<b>Rationale6</b>	N/A
<b>Calculator</b>	Yes	<b>Sample Answer</b>	N/A
<b>Ruler</b>	None		
<b>Standard 1 Code</b>	F.BF.A.1a	<b>Standard 1 Text</b>	N/A

During the first week that a movie was in theaters, 1 million people saw the movie. Each week going forward, half the number of people saw the movie as did the previous week.

How many people saw the movie in the fifth week?

- M 500,000
- P 250,000
- R 62,500
- S 31,250

## TN240094

<b>Label</b>	TN240094	<b>Max Points</b>	1
<b>Item Grade</b>	HS	<b>Rationale1</b>	N/A
<b>Item Content</b>	Math	<b>Rationale2</b>	N/A
<b>Item Type</b>	textEntry	<b>Rationale3</b>	N/A
<b>Key</b>	1.25	<b>Rationale4</b>	N/A
<b>DOK</b>	2	<b>Rationale5</b>	N/A
<b>Difficulty</b>	N/A	<b>Rationale6</b>	N/A
<b>Calculator</b>	Yes	<b>Sample Answer</b>	N/A
<b>Ruler</b>	None		
<b>Standard 1 Code</b>	A.REI.C.6	<b>Standard 1 Text</b>	N/A

Hannah bought 4 hamburgers and 2 orders of french fries at a local restaurant for \$16.50. Philip bought 5 hamburgers and 3 orders of french fries for \$21.25 at the same restaurant.

What is the price, in dollars, of 1 order of french fries?

**TN840074**

<b>Label</b>	TN840074	<b>Max Points</b>	1
<b>Item Grade</b>	HS	<b>Rationale1</b>	N/A
<b>Item Content</b>	Math	<b>Rationale2</b>	N/A
<b>Item Type</b>	textEntry	<b>Rationale3</b>	N/A
<b>Key</b>	6	<b>Rationale4</b>	N/A
<b>DOK</b>	2	<b>Rationale5</b>	N/A
<b>Difficulty</b>	N/A	<b>Rationale6</b>	N/A
<b>Calculator</b>	Yes	<b>Sample Answer</b>	N/A
<b>Ruler</b>	None		
<b>Standard 1 Code</b>	A.REI.B.3	<b>Standard 1 Text</b>	N/A

Consider the inequality  $51 \leq bx + 9$ .

What value of  $b$  will result in the solution  $x \geq 7$ ?

# TN340145

<b>Label</b>	TN340145	<b>Max Points</b>	1
<b>Item Grade</b>	HS	<b>Rationale1</b>	N/A
<b>Item Content</b>	Math	<b>Rationale2</b>	N/A
<b>Item Type</b>	choice	<b>Rationale3</b>	N/A
<b>Key</b>	1,4	<b>Rationale4</b>	N/A
<b>DOK</b>	2	<b>Rationale5</b>	N/A
<b>Difficulty</b>	N/A	<b>Rationale6</b>	N/A
<b>Calculator</b>	Yes	<b>Sample Answer</b>	N/A
<b>Ruler</b>	None		
<b>Standard 1 Code</b>	F.LE.A.1b	<b>Standard 1 Text</b>	N/A

Select **all** the tables in which the  $y$ -value changes at a constant rate per  $x$ -interval.

<b><math>x</math></b>	1	2	3	4	5
<b><math>y</math></b>	-0.5	0	0.5	1	1.5

<b><math>x</math></b>	1	2	3	4	5
<b><math>y</math></b>	1	4	9	16	25

<b><math>x</math></b>	1	2	3	4	5
<b><math>y</math></b>	2	4	8	16	32

<b><math>x</math></b>	1	2	3	4	5
<b><math>y</math></b>	1	-2	-5	-8	-11

<b><math>x</math></b>	1	2	3	4	5
<b><math>y</math></b>	1	8	27	64	125

## TN639838

<b>Label</b>	TN639838	<b>Max Points</b>	1
<b>Item Grade</b>	HS	<b>Rationale1</b>	N/A
<b>Item Content</b>	Math	<b>Rationale2</b>	N/A
<b>Item Type</b>	choice	<b>Rationale3</b>	N/A
<b>Key</b>	3,5	<b>Rationale4</b>	N/A
<b>DOK</b>	2	<b>Rationale5</b>	N/A
<b>Difficulty</b>	M	<b>Rationale6</b>	N/A
<b>Calculator</b>	Yes	<b>Sample Answer</b>	N/A
<b>Ruler</b>	None		
<b>Standard 1 Code</b>	A.SSE.B.3c	<b>Standard 1 Text</b>	N/A

Select all expressions equivalent to  $16(2)^{n-3}$ .

$(2)^{4n-12}$

$(2)^{4n-3}$

$(2)^{n+1}$

$8(2)^{n-1}$

$8(2)^{n-2}$

## TN439812

<b>Label</b>	TN439812	<b>Max Points</b>	1
<b>Item Grade</b>	HS	<b>Rationale1</b>	N/A
<b>Item Content</b>	Math	<b>Rationale2</b>	N/A
<b>Item Type</b>	choice	<b>Rationale3</b>	N/A
<b>Key</b>	1,2,5	<b>Rationale4</b>	N/A
<b>DOK</b>	2	<b>Rationale5</b>	N/A
<b>Difficulty</b>	N/A	<b>Rationale6</b>	N/A
<b>Calculator</b>	No	<b>Sample Answer</b>	N/A
<b>Ruler</b>	None		
<b>Standard 1 Code</b>	A.SSE.A.2	<b>Standard 1 Text</b>	N/A

Select all expressions that are equivalent to  $3x^5 - 6x^4y + 3x^3y^2$ .

$3x^3(x - y)^2$

$3x^3(x^2 - 2xy + y^2)$

$3x^3(x + y)^2$

$3x^3(x - y)(x + y)$

$3x^3(x - y)(x - y)$

## TN040009

<b>Label</b>	TN040009	<b>Max Points</b>	1
<b>Item Grade</b>	HS	<b>Rationale1</b>	N/A
<b>Item Content</b>	Math	<b>Rationale2</b>	N/A
<b>Item Type</b>	textEntry	<b>Rationale3</b>	N/A
<b>Key</b>	40 - 42i	<b>Rationale4</b>	N/A
<b>DOK</b>	2	<b>Rationale5</b>	N/A
<b>Difficulty</b>	N/A	<b>Rationale6</b>	N/A
<b>Calculator</b>	Yes	<b>Sample Answer</b>	N/A
<b>Ruler</b>	None		
<b>Standard 1 Code</b>	N.CN.A.2	<b>Standard 1 Text</b>	N/A

Write an equivalent form of  $(7 - 3i)^2$ .

## TN341360

<b>Label</b>	TN341360	<b>Max Points</b>	1
<b>Item Grade</b>	HS	<b>Rationale1</b>	N/A
<b>Item Content</b>	Math	<b>Rationale2</b>	N/A
<b>Item Type</b>	choice	<b>Rationale3</b>	N/A
<b>Key</b>	1	<b>Rationale4</b>	N/A
<b>DOK</b>	2	<b>Rationale5</b>	N/A
<b>Difficulty</b>	N/A	<b>Rationale6</b>	N/A
<b>Calculator</b>	Yes	<b>Sample Answer</b>	N/A
<b>Ruler</b>	None		
<b>Standard 1 Code</b>	A.REI.D.11	<b>Standard 1 Text</b>	N/A

Which system of equations has only **one** solution?

M  $y = x + 5$  and  $y = -3x + 6$

P  $y = x - 2$  and  $y = x + 4$

R  $y = |x - 5|$  and  $y = 0.2x + 1$

S  $y = x^2 - 1$  and  $y = 1.5x + 1$

## TN241416

<b>Label</b>	TN241416	<b>Max Points</b>	1
<b>Item Grade</b>	HS	<b>Rationale1</b>	N/A
<b>Item Content</b>	Math	<b>Rationale2</b>	N/A
<b>Item Type</b>	choice	<b>Rationale3</b>	N/A
<b>Key</b>	1	<b>Rationale4</b>	N/A
<b>DOK</b>	2	<b>Rationale5</b>	N/A
<b>Difficulty</b>	N/A	<b>Rationale6</b>	N/A
<b>Calculator</b>	Yes	<b>Sample Answer</b>	N/A
<b>Ruler</b>	None		
<b>Standard 1 Code</b>	F.IF.A.3	<b>Standard 1 Text</b>	N/A

A recursive sequence is defined as  $a_1 = 2$ ;  $a_{n+1} = -3a_n$ .

Which sequence follows from this recursive definition of a function?

- A  $2, -6, 18, -54, 162, \dots$
- B  $2, -3, -4, -5, -6, \dots$
- C  $-3, -6, -12, -24, -48, \dots$
- D  $-3, 2, 1, 0, -1, \dots$

## TN541442

<b>Label</b>	TN541442	<b>Max Points</b>	1
<b>Item Grade</b>	HS	<b>Rationale1</b>	N/A
<b>Item Content</b>	Math	<b>Rationale2</b>	N/A
<b>Item Type</b>	choice	<b>Rationale3</b>	N/A
<b>Key</b>	1	<b>Rationale4</b>	N/A
<b>DOK</b>	2	<b>Rationale5</b>	N/A
<b>Difficulty</b>	N/A	<b>Rationale6</b>	N/A
<b>Calculator</b>	Yes	<b>Sample Answer</b>	N/A
<b>Ruler</b>	None		
<b>Standard 1 Code</b>	A.REI.D.11	<b>Standard 1 Text</b>	N/A

Consider the functions shown.

$$f(x) = |x + 2|$$

$$g(x) = x + 8$$

What is the solution to  $f(x) = g(x)$ ?

- M  $(-5, 3)$
- P  $(-3, 1)$
- R  $(-2, -8)$
- S  $(0, 8)$

## TN041469

<b>Label</b>	TN041469	<b>Max Points</b>	1
<b>Item Grade</b>	HS	<b>Rationale1</b>	N/A
<b>Item Content</b>	Math	<b>Rationale2</b>	N/A
<b>Item Type</b>	textEntry	<b>Rationale3</b>	N/A
<b>Key</b>	2	<b>Rationale4</b>	N/A
<b>DOK</b>	2	<b>Rationale5</b>	N/A
<b>Difficulty</b>	N/A	<b>Rationale6</b>	N/A
<b>Calculator</b>	Yes	<b>Sample Answer</b>	N/A
<b>Ruler</b>	None		
<b>Standard 1 Code</b>	A.REI.A.2	<b>Standard 1 Text</b>	N/A

What value of  $x$  satisfies the equation  $\frac{x + 23}{x + 3} = 5$ ?

# TN141520

<b>Label</b>	TN141520	<b>Max Points</b>	1
<b>Item Grade</b>	HS	<b>Rationale1</b>	N/A
<b>Item Content</b>	Math	<b>Rationale2</b>	N/A
<b>Item Type</b>	choice	<b>Rationale3</b>	N/A
<b>Key</b>	1	<b>Rationale4</b>	N/A
<b>DOK</b>	3	<b>Rationale5</b>	N/A
<b>Difficulty</b>	M	<b>Rationale6</b>	N/A
<b>Calculator</b>	Yes	<b>Sample Answer</b>	N/A
<b>Ruler</b>	None		
<b>Standard 1 Code</b>	S.ID.B.6a	<b>Standard 1 Text</b>	N/A

Some values for functions  $W(x)$  and  $Z(x)$  are shown in the table.

$x$	$W(x)$	$Z(x)$
0	1.0	9
2	1.9	-3
4	3.6	-7
6	6.8	-3
8	12.9	9

Which statement **best** describes the functions?

- A  $W(x)$  is an exponential function, and  $Z(x)$  is a polynomial function.
- B  $W(x)$  is a polynomial function, and  $Z(x)$  is an exponential function.
- C  $W(x)$  is a polynomial function, and  $Z(x)$  is a logarithmic function.
- D  $W(x)$  is a trigonometric function, and  $Z(x)$  is a polynomial function.

**TN841594**

<b>Label</b>	TN841594	<b>Max Points</b>	1
<b>Item Grade</b>	HS	<b>Rationale1</b>	N/A
<b>Item Content</b>	Math	<b>Rationale2</b>	N/A
<b>Item Type</b>	textEntry	<b>Rationale3</b>	N/A
<b>Key</b>	524,286	<b>Rationale4</b>	N/A
<b>DOK</b>	2	<b>Rationale5</b>	N/A
<b>Difficulty</b>	N/A	<b>Rationale6</b>	N/A
<b>Calculator</b>	Yes	<b>Sample Answer</b>	N/A
<b>Ruler</b>	None		
<b>Standard 1 Code</b>	A.SSE.B.4	<b>Standard 1 Text</b>	N/A

Consider the geometric sequence.

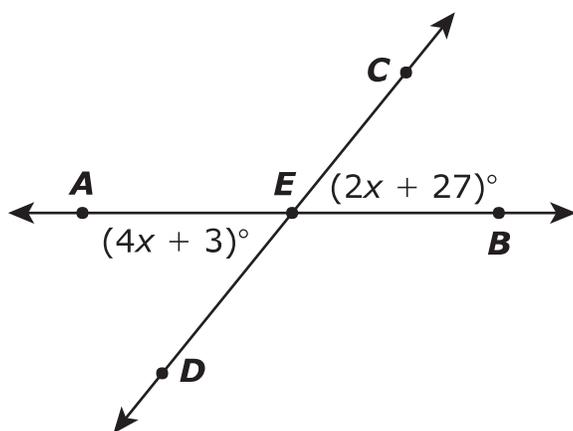
6, 24, 96, 384, ...

What is the sum of the first nine terms?

## TN141626

<b>Label</b>	TN141626	<b>Max Points</b>	1
<b>Item Grade</b>	HS	<b>Rationale1</b>	N/A
<b>Item Content</b>	Math	<b>Rationale2</b>	N/A
<b>Item Type</b>	choice	<b>Rationale3</b>	N/A
<b>Key</b>	3	<b>Rationale4</b>	N/A
<b>DOK</b>	2	<b>Rationale5</b>	N/A
<b>Difficulty</b>	N/A	<b>Rationale6</b>	N/A
<b>Calculator</b>	Yes	<b>Sample Answer</b>	N/A
<b>Ruler</b>	None		
<b>Standard 1 Code</b>	G.CO.C.9	<b>Standard 1 Text</b>	N/A

$\overline{AB}$  and  $\overline{CD}$  intersect at point  $E$ .



Find  $m\angle CEB$ .

M  $12^\circ$

P  $25^\circ$

R  $51^\circ$

S  $77^\circ$

## TN842677

<b>Label</b>	TN842677	<b>Max Points</b>	1
<b>Item Grade</b>	HS	<b>Rationale1</b>	N/A
<b>Item Content</b>	Math	<b>Rationale2</b>	N/A
<b>Item Type</b>	textEntry	<b>Rationale3</b>	N/A
<b>Key</b>	$(x+3)^2 + (y-4)^2 = 25$ or any equivalent equation	<b>Rationale4</b>	N/A
<b>DOK</b>	2	<b>Rationale5</b>	N/A
<b>Difficulty</b>	N/A	<b>Rationale6</b>	N/A
<b>Calculator</b>	No	<b>Sample Answer</b>	N/A
<b>Ruler</b>	None		
<b>Standard 1 Code</b>	G.GPE.A.1	<b>Standard 1 Text</b>	N/A

What is the equation of a circle with a radius of 5 units and a center at  $(-3, 4)$  ?

# TN942761

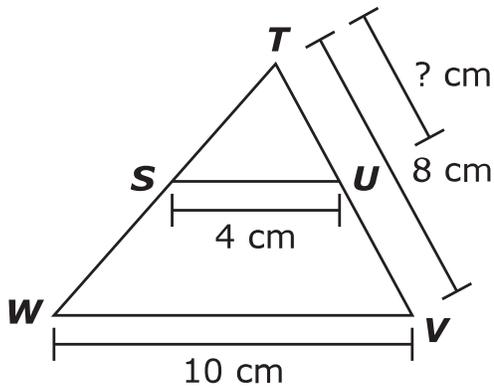
<b>Label</b>	TN942761	<b>Max Points</b>	1
<b>Item Grade</b>	HS	<b>Rationale1</b>	N/A
<b>Item Content</b>	Math	<b>Rationale2</b>	N/A
<b>Item Type</b>	textEntry	<b>Rationale3</b>	N/A
<b>Key</b>	625	<b>Rationale4</b>	N/A
<b>DOK</b>	2	<b>Rationale5</b>	N/A
<b>Difficulty</b>	N/A	<b>Rationale6</b>	N/A
<b>Calculator</b>	Yes	<b>Sample Answer</b>	N/A
<b>Ruler</b>	None		
<b>Standard 1 Code</b>	G.MG.A.3	<b>Standard 1 Text</b>	N/A

Miguel buys 100 feet of fence to enclose a rectangular area of his backyard so his dog can run freely. What is the maximum area, in square feet, he can enclose?

## TN741741

<b>Label</b>	TN741741	<b>Max Points</b>	1
<b>Item Grade</b>	HS	<b>Rationale1</b>	N/A
<b>Item Content</b>	Math	<b>Rationale2</b>	N/A
<b>Item Type</b>	textEntry	<b>Rationale3</b>	N/A
<b>Key</b>	3.2	<b>Rationale4</b>	N/A
<b>DOK</b>	2	<b>Rationale5</b>	N/A
<b>Difficulty</b>	N/A	<b>Rationale6</b>	N/A
<b>Calculator</b>	Yes	<b>Sample Answer</b>	N/A
<b>Ruler</b>	None		
<b>Standard 1 Code</b>	G.SRT.B.5	<b>Standard 1 Text</b>	N/A

In the figure shown,  $\overline{WV} \parallel \overline{SU}$ .

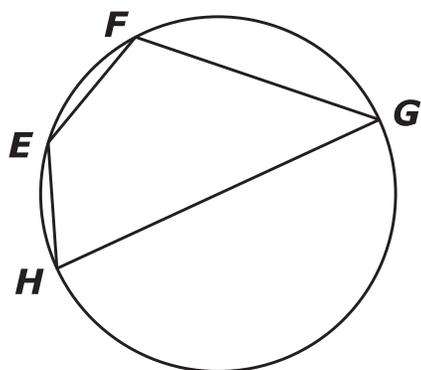


What is the length, in centimeters, of  $\overline{TU}$ ?

## TN241868

<b>Label</b>	TN241868	<b>Max Points</b>	1
<b>Item Grade</b>	HS	<b>Rationale1</b>	N/A
<b>Item Content</b>	Math	<b>Rationale2</b>	N/A
<b>Item Type</b>	choice	<b>Rationale3</b>	N/A
<b>Key</b>	2	<b>Rationale4</b>	N/A
<b>DOK</b>	2	<b>Rationale5</b>	N/A
<b>Difficulty</b>	N/A	<b>Rationale6</b>	N/A
<b>Calculator</b>	Yes	<b>Sample Answer</b>	N/A
<b>Ruler</b>	None		
<b>Standard 1 Code</b>	G.C.A.3	<b>Standard 1 Text</b>	N/A

Quadrilateral  $EFGH$  is inscribed in a circle as shown.



$m\angle F = (4x + 10)^\circ$ ,  $m\angle G = (2x - 5)^\circ$ , and  $m\angle H = (3x - 5)^\circ$ . What is the value of  $x$ ?

- A 20
- B 25
- C 38
- D 40

# TN542772

<b>Label</b>	TN542772	<b>Max Points</b>	1
<b>Item Grade</b>	HS	<b>Rationale1</b>	N/A
<b>Item Content</b>	Math	<b>Rationale2</b>	N/A
<b>Item Type</b>	textEntry	<b>Rationale3</b>	N/A
<b>Key</b>	0.001 - 0.002	<b>Rationale4</b>	N/A
<b>DOK</b>	2	<b>Rationale5</b>	N/A
<b>Difficulty</b>	N/A	<b>Rationale6</b>	N/A
<b>Calculator</b>	Yes	<b>Sample Answer</b>	N/A
<b>Ruler</b>	None		
<b>Standard 1 Code</b>	G.MG.A.2	<b>Standard 1 Text</b>	N/A

The table shows the square footage of various high schools in a city and the number of students who attend that school.

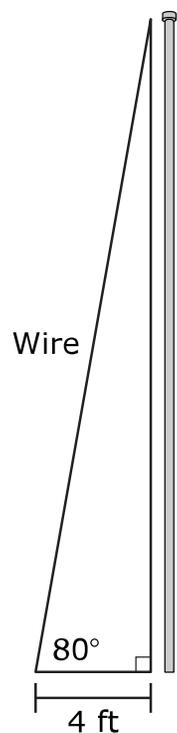
<b>Name of School</b>	<b>Square Footage</b>	<b>Number of Students</b>
Berkely High School	486,000	1,694
Commonwealth High School	400,000	1,872
Garfield High School	310,000	510
Hillview High School	268,000	2,370

What is the population density of the school that has the **lowest** number of students per square foot? Give your answer to three decimal places.

## TN841858

<b>Label</b>	TN841858	<b>Max Points</b>	1
<b>Item Grade</b>	HS	<b>Rationale1</b>	N/A
<b>Item Content</b>	Math	<b>Rationale2</b>	N/A
<b>Item Type</b>	textEntry	<b>Rationale3</b>	N/A
<b>Key</b>	na	<b>Rationale4</b>	N/A
<b>DOK</b>	2	<b>Rationale5</b>	N/A
<b>Difficulty</b>	N/A	<b>Rationale6</b>	N/A
<b>Calculator</b>	Yes	<b>Sample Answer</b>	N/A
<b>Ruler</b>	None		
<b>Standard 1 Code</b>	G.SRT.C.8	<b>Standard 1 Text</b>	N/A

Janet plans to replace a support wire attached to a light pole, as shown.



To the nearest foot, what is the length of the wire?

## TN042732

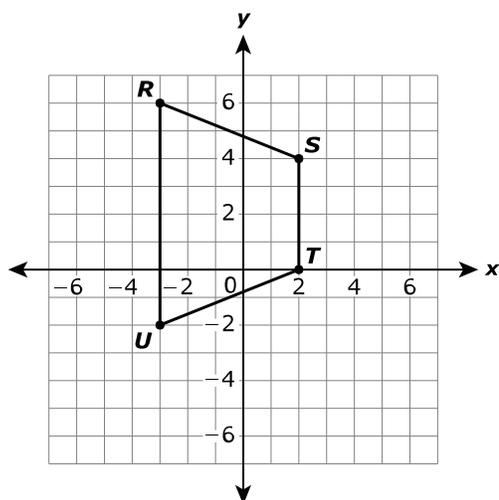
<b>Label</b>	TN042732	<b>Max Points</b>	1
<b>Item Grade</b>	HS	<b>Rationale1</b>	N/A
<b>Item Content</b>	Math	<b>Rationale2</b>	N/A
<b>Item Type</b>	textEntry	<b>Rationale3</b>	N/A
<b>Key</b>	40	<b>Rationale4</b>	N/A
<b>DOK</b>	2	<b>Rationale5</b>	N/A
<b>Difficulty</b>	N/A	<b>Rationale6</b>	N/A
<b>Calculator</b>	Yes	<b>Sample Answer</b>	N/A
<b>Ruler</b>	None		
<b>Standard 1 Code</b>	G.GPE.B.7	<b>Standard 1 Text</b>	N/A

What is the perimeter, in grid units, of a regular octagon that has one side with endpoints  $(-1, 2)$  and  $(3, -1)$ ?

## TN541660

<b>Label</b>	TN541660	<b>Max Points</b>	1
<b>Item Grade</b>	HS	<b>Rationale1</b>	N/A
<b>Item Content</b>	Math	<b>Rationale2</b>	N/A
<b>Item Type</b>	textEntry	<b>Rationale3</b>	N/A
<b>Key</b>	$y = 2$	<b>Rationale4</b>	N/A
<b>DOK</b>	1	<b>Rationale5</b>	N/A
<b>Difficulty</b>	N/A	<b>Rationale6</b>	N/A
<b>Calculator</b>	Yes	<b>Sample Answer</b>	N/A
<b>Ruler</b>	None		
<b>Standard 1 Code</b>	G.CO.A.3	<b>Standard 1 Text</b>	N/A

Trapezoid  $RSTU$  is shown.



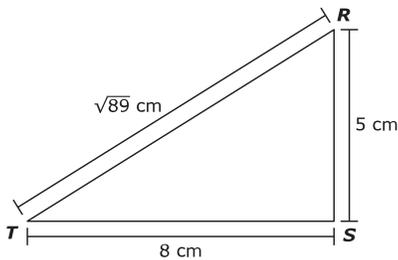
Write the equation for the line that would map the trapezoid onto itself.

	±	+	-	×	÷	=	<	≤	>	≥	π	○		"	$\frac{\square}{\square}$	$\frac{\square\square}{\square}$	$\frac{\square\square}{\square\square}$
←	→	$\square^\square$	(□)	□	{□}	$\sqrt{\square}$	$\sqrt[\square]{\square}$	∞	≠	~	≈	≅	∅	→	θ	log	ln
		Σ															

## TN641837

<b>Label</b>	TN641837	<b>Max Points</b>	1
<b>Item Grade</b>	HS	<b>Rationale1</b>	N/A
<b>Item Content</b>	Math	<b>Rationale2</b>	N/A
<b>Item Type</b>	textEntry	<b>Rationale3</b>	N/A
<b>Key</b>	5/8 or 7.5/12 or any equivalent fraction	<b>Rationale4</b>	N/A
<b>DOK</b>	1	<b>Rationale5</b>	N/A
<b>Difficulty</b>	N/A	<b>Rationale6</b>	N/A
<b>Calculator</b>	Yes	<b>Sample Answer</b>	N/A
<b>Ruler</b>	None		
<b>Standard 1 Code</b>	G.SRT.C.8	<b>Standard 1 Text</b>	N/A

Triangle  $RST$  is shown.



$\triangle JKL \sim \triangle RST$  with a scale factor of 1.5.

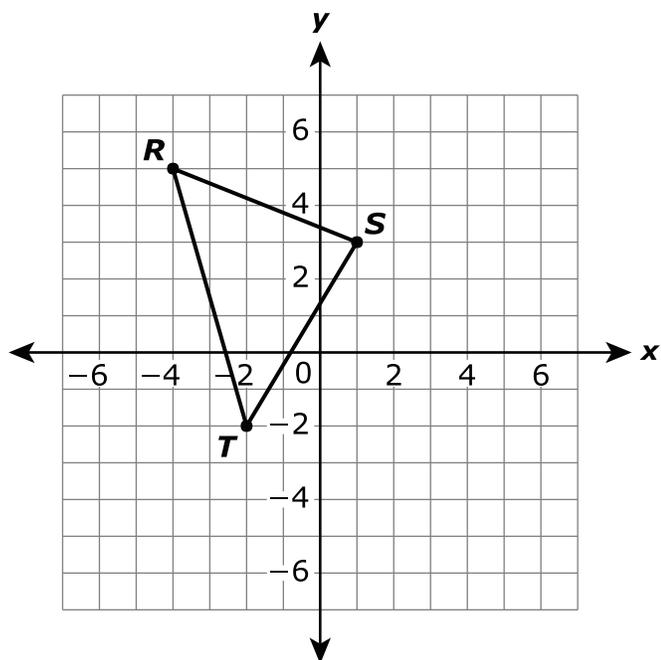
What is  $\tan(L)$ ?

$\pm$	$+$	$-$	$\times$	$\div$	$=$	$<$	$\leq$	$>$	$\geq$	$\pi$	$\circ$	$ $	$''$	$\frac{\square}{\square}$	$\frac{\square}{\square}$	$\frac{\square}{\square}$	
$\leftarrow$	$\rightarrow$	$\square^\square$	$(\square)$	$ \square $	$\{\square\}$	$\sqrt{\square}$	$\sqrt[\square]{\square}$	$\infty$	$\neq$	$\sim$	$\approx$	$\cong$	$\emptyset$	$\rightarrow$	$\theta$	$\log$	$\ln$
$\Sigma$																	

## TN541709

<b>Label</b>	TN541709	<b>Max Points</b>	1
<b>Item Grade</b>	HS	<b>Rationale1</b>	N/A
<b>Item Content</b>	Math	<b>Rationale2</b>	N/A
<b>Item Type</b>	textEntry	<b>Rationale3</b>	N/A
<b>Key</b>	4	<b>Rationale4</b>	N/A
<b>DOK</b>	2	<b>Rationale5</b>	N/A
<b>Difficulty</b>	N/A	<b>Rationale6</b>	N/A
<b>Calculator</b>	Yes	<b>Sample Answer</b>	N/A
<b>Ruler</b>	None		
<b>Standard 1 Code</b>	G.CO.A.2	<b>Standard 1 Text</b>	N/A

Triangle  $RST$  is shown.



What is the  $y$ -coordinate of the final image of vertex  $T$  after the triangle is reflected over the  $x$ -axis followed by a shift of 3 units to the left and 2 units up?

## TN842783

<b>Label</b>	TN842783	<b>Max Points</b>	1
<b>Item Grade</b>	HS	<b>Rationale1</b>	N/A
<b>Item Content</b>	Math	<b>Rationale2</b>	N/A
<b>Item Type</b>	textEntry	<b>Rationale3</b>	N/A
<b>Key</b>	1395 - 1397	<b>Rationale4</b>	N/A
<b>DOK</b>	2	<b>Rationale5</b>	N/A
<b>Difficulty</b>	N/A	<b>Rationale6</b>	N/A
<b>Calculator</b>	Yes	<b>Sample Answer</b>	N/A
<b>Ruler</b>	None		
<b>Standard 1 Code</b>	G.MG.A.2	<b>Standard 1 Text</b>	N/A

Lead has a density of 11.36 grams per cubic centimeter. Iron has a density of 7.87 grams per cubic centimeter.

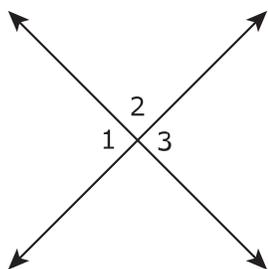
A rectangular prism with dimensions 5 centimeters by 10 centimeters by 8 centimeters is made of each material.

To the nearest gram, how much greater is the mass of the prism made of lead than the one made of iron?

## TN941576

<b>Label</b>	TN941576	<b>Max Points</b>	1
<b>Item Grade</b>	HS	<b>Rationale1</b>	N/A
<b>Item Content</b>	Math	<b>Rationale2</b>	N/A
<b>Item Type</b>	choice	<b>Rationale3</b>	N/A
<b>Key</b>	2	<b>Rationale4</b>	N/A
<b>DOK</b>	1	<b>Rationale5</b>	N/A
<b>Difficulty</b>	N/A	<b>Rationale6</b>	N/A
<b>Calculator</b>	No	<b>Sample Answer</b>	N/A
<b>Ruler</b>	None		
<b>Standard 1 Code</b>	G.CO.C.9	<b>Standard 1 Text</b>	N/A

The diagram shown is to be used to prove that vertical angles are congruent.



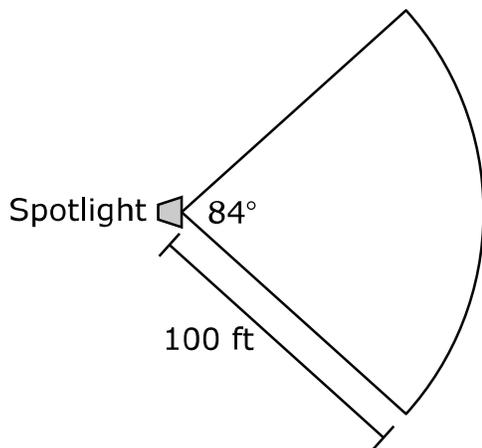
Which of these theorems will be used to prove  $\angle 1 \cong \angle 3$ ?

- M Complements of the same angle are congruent.
- P Supplements of the same angle are congruent.
- R Angles congruent to the same angle are congruent to each other.
- S All right angles are congruent.

# TN742663

<b>Label</b>	TN742663	<b>Max Points</b>	1
<b>Item Grade</b>	HS	<b>Rationale1</b>	N/A
<b>Item Content</b>	Math	<b>Rationale2</b>	N/A
<b>Item Type</b>	textEntry	<b>Rationale3</b>	N/A
<b>Key</b>	7326-7333	<b>Rationale4</b>	N/A
<b>DOK</b>	2	<b>Rationale5</b>	N/A
<b>Difficulty</b>	N/A	<b>Rationale6</b>	N/A
<b>Calculator</b>	Yes	<b>Sample Answer</b>	N/A
<b>Ruler</b>	None		
<b>Standard 1 Code</b>	G.C.B.5	<b>Standard 1 Text</b>	N/A

A spotlight has a beam that travels 100 feet and covers an area intercepted by an  $84^\circ$  angle, as shown.



To the nearest square foot, what area does the spotlight cover?

Enter your answer in the space provided.

←
→

±
+
-
×
÷
=
<
≤
>
≥
π
○
|
"
 $\frac{\square}{\square}$ 
 $\frac{\square\square}{\square\square}$ 
 $\frac{\square\square\square}{\square\square\square}$

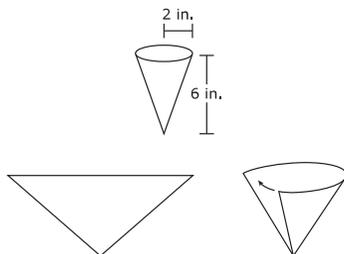
$\square^\square$ 
( $\square$ )
|\square|
{ $\square$ }
 $\sqrt{\square}$ 
 $\sqrt[\square]{\square}$ 
∞
≠
~
≈
≅
∅
→
∅
log
ln

Σ

## TN042765

<b>Label</b>	TN042765	<b>Max Points</b>	1
<b>Item Grade</b>	HS	<b>Rationale1</b>	N/A
<b>Item Content</b>	Math	<b>Rationale2</b>	N/A
<b>Item Type</b>	textEntry	<b>Rationale3</b>	N/A
<b>Key</b>	35 to 40	<b>Rationale4</b>	N/A
<b>DOK</b>	2	<b>Rationale5</b>	N/A
<b>Difficulty</b>	N/A	<b>Rationale6</b>	N/A
<b>Calculator</b>	Yes	<b>Sample Answer</b>	N/A
<b>Ruler</b>	None		
<b>Standard 1 Code</b>	G.MG.A.1	<b>Standard 1 Text</b>	N/A

The waffle cones at the ice cream shop have a radius of 2 inches and a height of 6 inches. They are made using a triangular piece of waffle material, as shown.



What is the approximate area, in square inches, of the triangular piece of waffle material used for the waffle cone?

## TN941689

<b>Label</b>	TN941689	<b>Max Points</b>	1
<b>Item Grade</b>	HS	<b>Rationale1</b>	N/A
<b>Item Content</b>	Math	<b>Rationale2</b>	N/A
<b>Item Type</b>	textEntry	<b>Rationale3</b>	N/A
<b>Key</b>	na	<b>Rationale4</b>	N/A
<b>DOK</b>	2	<b>Rationale5</b>	N/A
<b>Difficulty</b>	N/A	<b>Rationale6</b>	N/A
<b>Calculator</b>	Yes	<b>Sample Answer</b>	N/A
<b>Ruler</b>	None		
<b>Standard 1 Code</b>	F.BF.A.2	<b>Standard 1 Text</b>	N/A

A geometric sequence is represented by the recursive formula  $a_1 = 5$ ,  $a_n = a_{n-1}(7)$ .

Write the explicit formula to represent the sequence.

## TN545842

<b>Label</b>	TN545842	<b>Max Points</b>	1
<b>Item Grade</b>	HS	<b>Rationale1</b>	N/A
<b>Item Content</b>	Math	<b>Rationale2</b>	N/A
<b>Item Type</b>	textEntry	<b>Rationale3</b>	N/A
<b>Key</b>	$h(t) = -3(t - 2)^2 + 72$	<b>Rationale4</b>	N/A
<b>DOK</b>	3	<b>Rationale5</b>	N/A
<b>Difficulty</b>	N/A	<b>Rationale6</b>	N/A
<b>Calculator</b>	Yes	<b>Sample Answer</b>	N/A
<b>Ruler</b>	None		
<b>Standard 1 Code</b>	A.SSE.B.3	<b>Standard 1 Text</b>	N/A

A model rocket is launched at time  $t = 0$  from the top of a hill with a height of 60 feet. The formula  $h(t) = -3t^2 + 12t + 60$  gives the rocket's height after  $t$  seconds. Write an equivalent form of the equation to reveal the maximum height of the rocket.

## TN545866

<b>Label</b>	TN545866	<b>Max Points</b>	1
<b>Item Grade</b>	HS	<b>Rationale1</b>	N/A
<b>Item Content</b>	Math	<b>Rationale2</b>	N/A
<b>Item Type</b>	choice	<b>Rationale3</b>	N/A
<b>Key</b>	3,4	<b>Rationale4</b>	N/A
<b>DOK</b>	2	<b>Rationale5</b>	N/A
<b>Difficulty</b>	N/A	<b>Rationale6</b>	N/A
<b>Calculator</b>	Yes	<b>Sample Answer</b>	N/A
<b>Ruler</b>	None		
<b>Standard 1 Code</b>	A.REI.B.4b	<b>Standard 1 Text</b>	N/A

Select all the solutions to the equation  $x^2 + 2x + 10 = 0$ .

2

5

$-1 - 3i$

$-1 + 3i$

$-1 - i\sqrt{11}$

$-1 + i\sqrt{11}$

**TN745862**

<b>Label</b>	TN745862	<b>Max Points</b>	1
<b>Item Grade</b>	HS	<b>Rationale1</b>	N/A
<b>Item Content</b>	Math	<b>Rationale2</b>	N/A
<b>Item Type</b>	textEntry	<b>Rationale3</b>	N/A
<b>Key</b>	18 or -18	<b>Rationale4</b>	N/A
<b>DOK</b>	2	<b>Rationale5</b>	N/A
<b>Difficulty</b>	N/A	<b>Rationale6</b>	N/A
<b>Calculator</b>	Yes	<b>Sample Answer</b>	N/A
<b>Ruler</b>	None		
<b>Standard 1 Code</b>	A.SSE.B.3b	<b>Standard 1 Text</b>	N/A

The polynomial  $f(x) = x^2 + kx + 81$  is a perfect square trinomial. What is the value of  $k$ ?

## TN545892

<b>Label</b>	TN545892	<b>Max Points</b>	1
<b>Item Grade</b>	HS	<b>Rationale1</b>	N/A
<b>Item Content</b>	Math	<b>Rationale2</b>	N/A
<b>Item Type</b>	choice	<b>Rationale3</b>	N/A
<b>Key</b>	1,2	<b>Rationale4</b>	N/A
<b>DOK</b>	2	<b>Rationale5</b>	N/A
<b>Difficulty</b>	N/A	<b>Rationale6</b>	N/A
<b>Calculator</b>	Yes	<b>Sample Answer</b>	N/A
<b>Ruler</b>	None		
<b>Standard 1 Code</b>	F.TF.A.2	<b>Standard 1 Text</b>	N/A

The ordered pairs listed are the coordinates of points on the terminal sides of angles in standard position in the coordinate plane.

Which two ordered pairs give the same value for  $\sin \theta$ ?

- $\left(\frac{1}{2}, \frac{\sqrt{3}}{2}\right)$
- $\left(-\frac{1}{2}, \frac{\sqrt{3}}{2}\right)$
- $\left(\frac{\sqrt{3}}{2}, -\frac{1}{2}\right)$
- $\left(-\frac{1}{2}, -\frac{\sqrt{3}}{2}\right)$
- $\left(-\frac{\sqrt{3}}{2}, \frac{1}{2}\right)$

## TN048721

<b>Label</b>	TN048721	<b>Max Points</b>	1
<b>Item Grade</b>	HS	<b>Rationale1</b>	N/A
<b>Item Content</b>	Math	<b>Rationale2</b>	N/A
<b>Item Type</b>	textEntry	<b>Rationale3</b>	N/A
<b>Key</b>	$y = -(x+4)(x-2)$ or equivalent	<b>Rationale4</b>	N/A
<b>DOK</b>	2	<b>Rationale5</b>	N/A
<b>Difficulty</b>	N/A	<b>Rationale6</b>	N/A
<b>Calculator</b>	Yes	<b>Sample Answer</b>	N/A
<b>Ruler</b>	None		
<b>Standard 1 Code</b>	A.CED.A.2	<b>Standard 1 Text</b>	N/A

The graph of a quadratic equation has a maximum of  $(-1, 9)$  and has  $x$ -intercepts at  $x = -4$  and  $x = 2$ .

Write the equation that could represent the graph.

## TN342790

<b>Label</b>	TN342790	<b>Max Points</b>	1
<b>Item Grade</b>	HS	<b>Rationale1</b>	N/A
<b>Item Content</b>	Math	<b>Rationale2</b>	N/A
<b>Item Type</b>	choice	<b>Rationale3</b>	N/A
<b>Key</b>	1,3	<b>Rationale4</b>	N/A
<b>DOK</b>	2	<b>Rationale5</b>	N/A
<b>Difficulty</b>	N/A	<b>Rationale6</b>	N/A
<b>Calculator</b>	Yes	<b>Sample Answer</b>	N/A
<b>Ruler</b>	None		
<b>Standard 1 Code</b>	G.GPE.A.2	<b>Standard 1 Text</b>	N/A

Consider the parabola with the equation  $(x + 5)^2 = 8(y - 6)$ .

Which two statements about the parabola are true?

- The vertex is  $(-5, 6)$ .
- The vertex is  $(5, -6)$ .
- The directrix is  $y = 4$ .
- The directrix is  $y = -13$ .
- The directrix is  $x = 4$ .
- The directrix is  $x = -2$ .

## TN442698

<b>Label</b>	TN442698	<b>Max Points</b>	1
<b>Item Grade</b>	HS	<b>Rationale1</b>	N/A
<b>Item Content</b>	Math	<b>Rationale2</b>	N/A
<b>Item Type</b>	choice	<b>Rationale3</b>	N/A
<b>Key</b>	4	<b>Rationale4</b>	N/A
<b>DOK</b>	2	<b>Rationale5</b>	N/A
<b>Difficulty</b>	N/A	<b>Rationale6</b>	N/A
<b>Calculator</b>	No	<b>Sample Answer</b>	N/A
<b>Ruler</b>	None		
<b>Standard 1 Code</b>	A.REI.A.1	<b>Standard 1 Text</b>	N/A

Consider the equation  $x - 2 = \sqrt{4x + 13}$ .

Which statement is the first step for solving this equation?

- M subtract 2 from both sides to get  $x = \sqrt{4x + 13} - 2$
- P add 2 to both sides to get  $x = \sqrt{4x + 13} + 2$
- R square both sides to get  $x^2 - 4 = 4x + 13$
- S square both sides to get  $x^2 - 4x + 4 = 4x + 13$

## TN845885

<b>Label</b>	TN845885	<b>Max Points</b>	1
<b>Item Grade</b>	HS	<b>Rationale1</b>	N/A
<b>Item Content</b>	Math	<b>Rationale2</b>	N/A
<b>Item Type</b>	textEntry	<b>Rationale3</b>	N/A
<b>Key</b>	70	<b>Rationale4</b>	N/A
<b>DOK</b>	2	<b>Rationale5</b>	N/A
<b>Difficulty</b>	N/A	<b>Rationale6</b>	N/A
<b>Calculator</b>	Yes	<b>Sample Answer</b>	N/A
<b>Ruler</b>	None		
<b>Standard 1 Code</b>	A.APR.D.6	<b>Standard 1 Text</b>	N/A

What is the remainder when  $(x^3 + 8x^2 + 6)$  is divided by  $(x + 4)$ ?

**This page intentionally left blank.**

Tennessee Comprehensive  
Assessment Program TCAP  
TNReady—Math  
EOC Item Release  
Spring 2017

