Tennessee Comprehensive Assessment Program

TCAP

Integrated Math I
Item Release

Spring 2021

TN Department of **Education**

Metadata- Math

Items

Page Number	UIN	Grade	Item Type	Key	DOK	TN Standards	Calculator
4	TN0009879	Int Math I	MC	D	2	M1.F.LE.B.4	Y
5	TN0009880	Int Math I	MC	C	2	M1.A.SSE.A.1b	Y
6	TN0009882	Int Math I	MC	D	2	M1.A.CED.A.3	N
7	TN0009887	Int Math I	MC	D	2	M1.F.IF.C.6a	N
8	TN0025890	Int Math I	MC	B	1	M1.A.REI.C.4	N
9	TN0025944	Int Math I	MC	C	2	M1.G.CO.A.2	Y
10	TN0025977	Int Math I	MS	A,D,F	2	M1.G.CO.C.10	Y
11	TN0028389	Int Math I	MC	C	2	M1.A.CED.A.1	Y
12	TN0028406	Int Math I	MS	A,B,D	2	M1.G.CO.B.8	Y
13	TN0031708	Int Math I	MS	A,B,F	2	M1.F.LE.A.1a	N
14	TN0084816	Int Math I	MC	D	2	M1.F.LE.A.2	Y
15	TN0086623	Int Math I	MC	D	2	M1.F.LE.A.2	Y
16	TN0087121	Int Math I	MC	D	3	M1.N.Q.A.1	N
17	TN0087289	Int Math I	MC	C	2	M1.G.CO.B.8	N
18	TN216097	Int Math I	MC	B	2	M1.F.BF.A.1a	Y
19	TN714448	Int Math I	MC	C	1	M1.A.REI.C.5	Y
20	TN715700	Int Math I	MC	B	2	M1.A.REI.B.2	Y
21	TN916278	Int Math I	MS	B,D,E	2	M1.F.IF.A.1	N

## Metadata Definitions:

UIN	Unique letter/number code used to identify the item.
Grade	Grade level or Course.
Item Type	Indicates the type of item. MC= Multiple Choice; MS= Multiple Select
Key	Correct answer. This may be blank for constructed response items where students write or type their responses.
DOK	Depth of Knowledge (cognitive complexity) is measured on a three-point scale. 1 = Recall or simple reproduction of information; 2 = Skills and concepts: comprehension and processing of text; 3 = Strategic thinking, prediction, elaboration.
TN Standards	Primary educational standard assessed.
Calculator	Y for items that permit calculator use.

00. Hillary bought an antique dresser. The function $f(x) = 110(1.05^x)$ can be used to find the value of her dresser x years after she purchased it.

Which statement about the value of the dresser is true?

A. It increases by $110 every year.

B. It increases by $105 every year.

C. It increases by 10% every year.

D. It increases by 5% every year.

00. Malea is creating a quilt using this pattern of parallelograms. The design starts with the center ring of parallelograms and continues to add rings of parallelograms going out from the center. Malea uses the expression $8 + 8(n - 1)$ to find the number of parallelograms needed for a given ring, n.
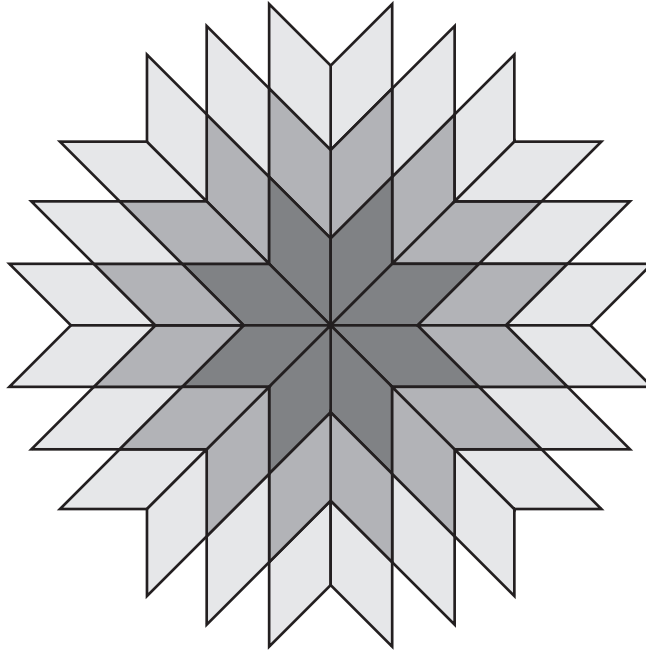
Which statement correctly describes what $8(n - 1)$ represents in the pattern?

A. the number of parallelograms in the first ring

B. the number of parallelograms in the current ring

C. the number of parallelograms in the previous ring

D. the total number of parallelograms for all of the rings

00. Camille started a pet service business for the summer. She washes dogs during the day and walks dogs in the evenings. However, Camille can walk only a maximum of 5 dogs in an evening. Her charges for each service are shown.

- $8 per dog for a wash
- $12 per dog for a walk

Camille wants to work enough in one day to buy a new camera for $100.

Which system of equations represents this situation, where x is the number of dogs she washes and y is the number of dogs she walks?
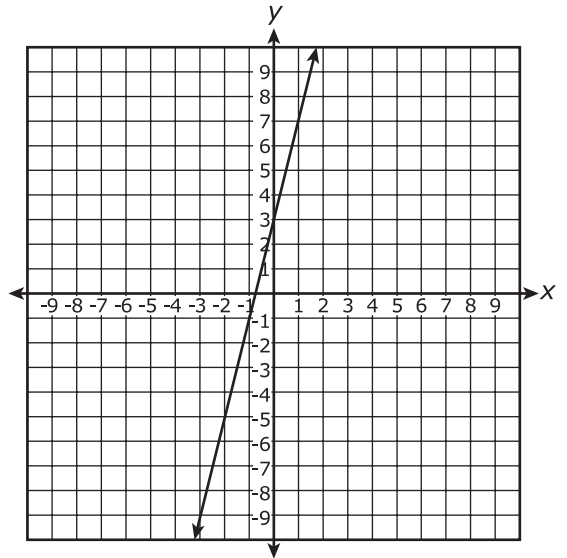
A. $\begin{cases} y \geq 5 \\ 8x + 12y \geq 100 \end{cases}$

B. $\begin{cases} y \geq 5 \\ 8x + 12y \leq 100 \end{cases}$

C. $\begin{cases} y \leq 5 \\ 8x + 12y \leq 100 \end{cases}$

D. $\begin{cases} y \leq 5 \\ 8x + 12y \geq 100 \end{cases}$

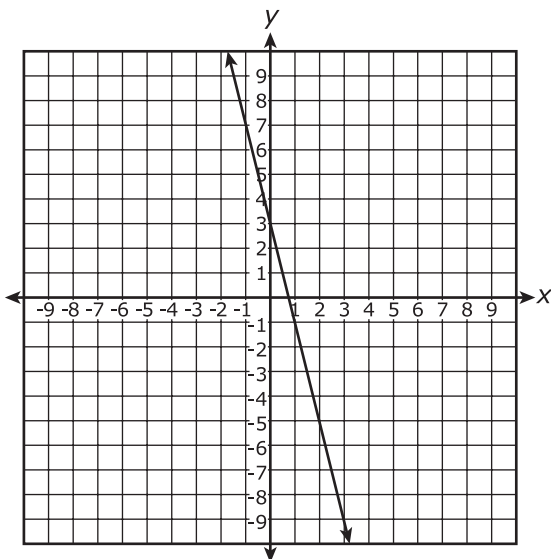**00.** Which coordinate plane shows the graph of $4x - y = 3$?
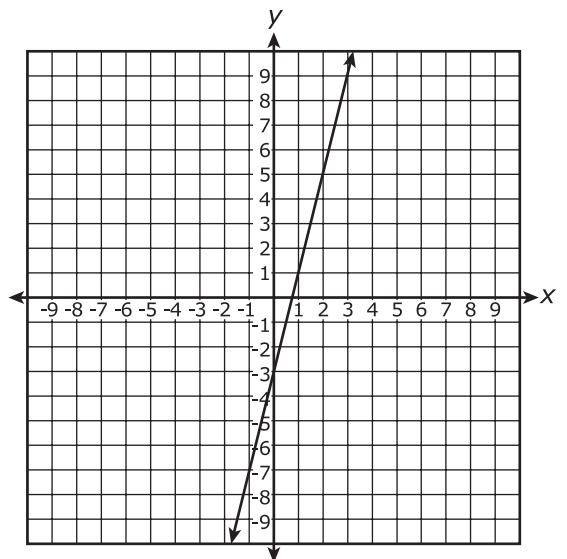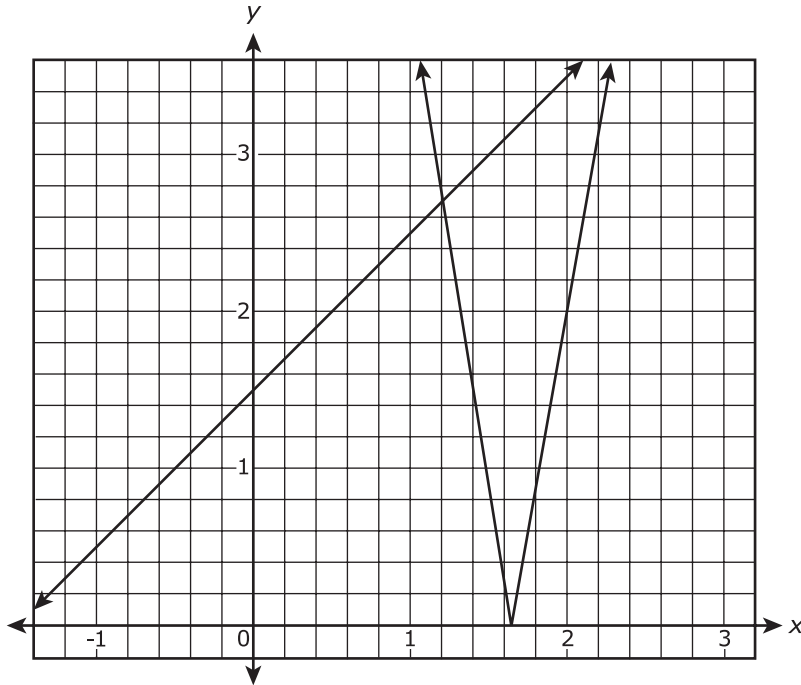
A.
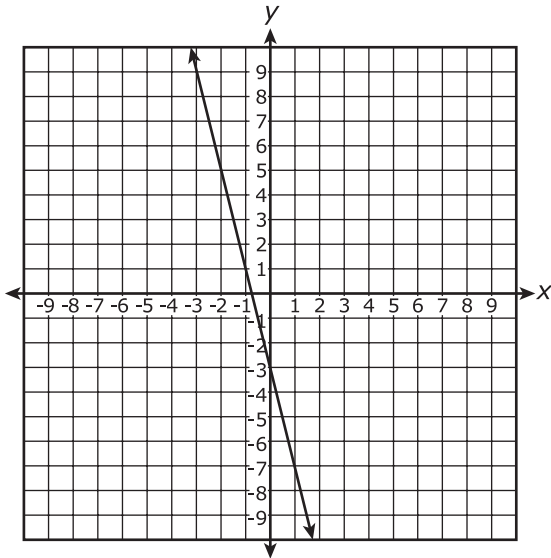
C.

B.

D.

00. The graph of $f(x) = |6x - 10|$ and $g(x) = x + 1.5$ is shown.

Using the graph, which is the **best** estimate for a solution of the equation $f(x) = g(x)$?

A. 0.5

B. 1.2

C. 1.7

D. 2.7

00. Which mapping represents a 90° clockwise rotation about the origin for all points on the coordinate plane?
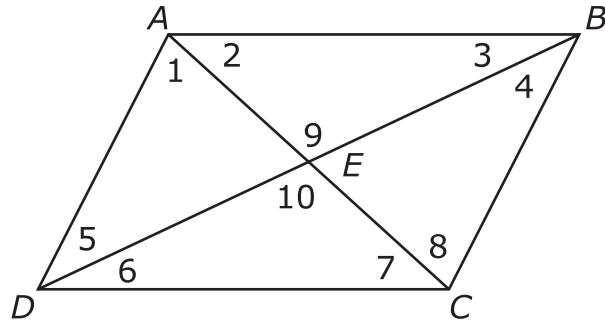
A. $(x, y) \rightarrow (-x, y)$

B. $(x, y) \rightarrow (-x, -y)$

C. $(x, y) \rightarrow (y, -x)$

D. $(x, y) \rightarrow (y, x)$

00. Parallelogram *ABCD* is shown. Diagonals $\overline{AC}$ and $\overline{BD}$ intersect at point *E*.

Which **three** congruent relationships are necessary to prove $\triangle AEB \cong \triangle CED$?

A. $\overline{AB} \cong \overline{CD}$

B. $\overline{AD} \cong \overline{CB}$

C. $\angle 1 \cong \angle 8$

D. $\angle 2 \cong \angle 7$

E. $\angle 6 \cong \angle 2$

F. $\angle 9 \cong \angle 10$

00. Jessica borrows $3000 on a loan that has an annual interest rate of 9.9%. She does not make any payment on the loan for the first 4 years.

Which equation can be used to determine how much Jessica will owe in total, x, after 4 years?

A. $3000 = 4(1.099)^x$

B. $3000 = x(4)^{1.099}$

C. $x = 3000(1.099)^4$

D. $x = 4(3000)^{1.099}$

00. Equilateral triangle *PQR* is drawn on a coordinate plane. It is rotated 90° clockwise about point *P*, and then translated 6 units up, to create the image triangle *P′Q′R′*.

Which criteria for triangle congruence can be used to prove that
△ *PQR* ≅ △ *P′Q′R′*? Select the **three** correct answers.

A. side-side-side

B. side-angle-side

C. side-side-angle

D. angle-side-angle

E. angle-angle-angle

00. Which sequences represent exponential functions? Select **all** that apply.

A. 2,6,18,54,162,…

B. 9,18,36,72,144,…

C. 180,136,92,48,4,…

D. 17,11,5, − 1, − 7,…

E. 34,64,94,124,154,…

F. 120,60,30,15,7.5,…

00. An arithmetic sequence is described.

- The value of the 4th term is 74.
- The value of the 10th term is 98.

Which equation can be used to determine the value of the nth term in the arithmetic sequence?

A. $a_n = 10n + 34$

B. $a_n = 9n + 8$

C. $a_n = 6n + 24$

D. $a_n = 4n + 58$

00. David drank a cup of coffee containing 250 milligrams of caffeine. The table shows the amount of caffeine from the cup of coffee in his body for the next three hours.

Caffeine in the Body

Hours	Caffeine (mg)
0	250
1	200
2	160
3	128

Which equation models the amount of caffeine from the cup of coffee remaining in David's body after the nth hour?

A. $a_n = 250\left(\dfrac{1}{5}\right)^{n-1}$

B. $a_n = 250\left(\dfrac{1}{5}\right)^{n}$

C. $a_n = 250\left(\dfrac{4}{5}\right)^{n-1}$

D. $a_n = 250\left(\dfrac{4}{5}\right)^{n}$

00. A gardener needs to move 180 cubic feet of topsoil closer to his garden.

- He will use a wheelbarrow to move all the topsoil.
- Each wheelbarrow load contains 6 cubic feet of topsoil.
- Each wheelbarrow load takes 12 minutes to complete.

Which expression can be used to determine the length of time, in hours, it will take the gardener to move all the topsoil?

A. $\dfrac{180 \text{ ft}^3}{1} \cdot \dfrac{12 \text{ min}}{1 \text{ load}} \cdot \dfrac{60 \text{ min}}{1 \text{ hr}} \cdot \dfrac{1 \text{ load}}{6 \text{ ft}^3}$

B. $\dfrac{180 \text{ ft}^3}{1} \cdot \dfrac{60 \text{ min}}{1 \text{ hr}} \cdot \dfrac{6 \text{ ft}^3}{1 \text{ load}} \cdot \dfrac{12 \text{ min}}{1 \text{ load}}$

C. $\dfrac{180 \text{ ft}^3}{1} \cdot \dfrac{1 \text{ load}}{12 \text{ min}} \cdot \dfrac{6 \text{ ft}^3}{1 \text{ load}} \cdot \dfrac{1 \text{ hr}}{60 \text{ min}}$

D. $\dfrac{180 \text{ ft}^3}{1} \cdot \dfrac{1 \text{ load}}{6 \text{ ft}^3} \cdot \dfrac{12 \text{ min}}{1 \text{ load}} \cdot \dfrac{1 \text{ hr}}{60 \text{ min}}$

00. In a coordinate plane, △ *ABC* is reflected over the *y*-axis and then reflected over the *x*-axis to create a triangle with vertices *D*, *E*, and *F*. Two congruency relationships are given.

- $\overline{AC} \cong \overline{EF}$

- $\angle F \cong \angle A$

Which statement is true?

A. If $\overline{BC} \cong \overline{DF}$, then △ *ABC* ≅ △ *DEF* by Side-Angle-Side theorem.

B. If $\overline{DE} \cong \overline{BC}$, then △ *ABC* ≅ △ *FED* by Side-Angle-Side theorem.

C. If $\angle B \cong \angle D$, then △ *ABC* ≅ △ *FDE* by Angle-Angle-Side theorem.

D. If $\angle B \cong \angle D$, then △ *ABC* ≅ △ *FED* by Angle-Angle-Side theorem.

00. Nathan is decorating the triangular area below a staircase with rows of triangular tiles.

- He starts at the top and makes the first 5 rows.

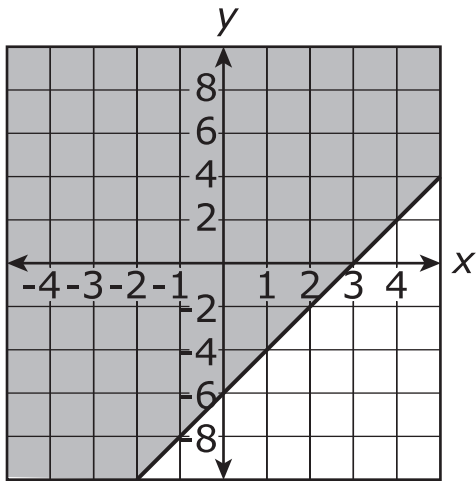- Each row has more tiles than the previous row.
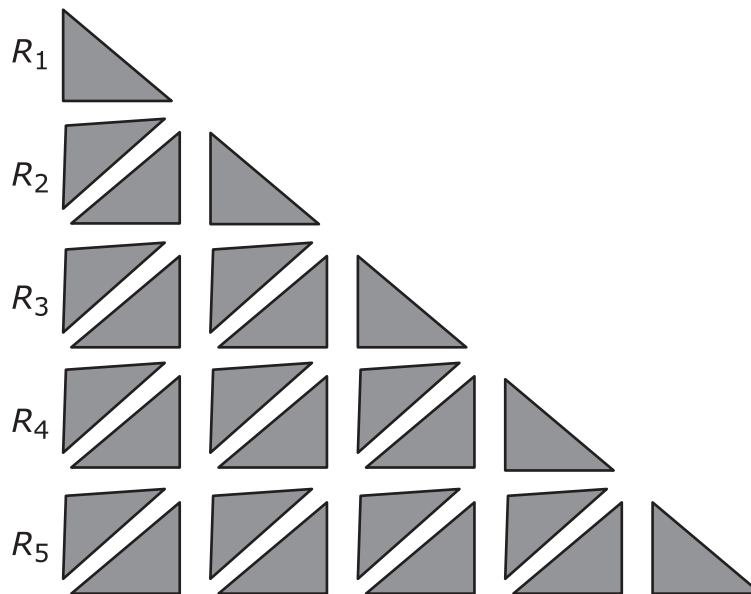
Which recursive formula could be used to find the number of tiles in any row?
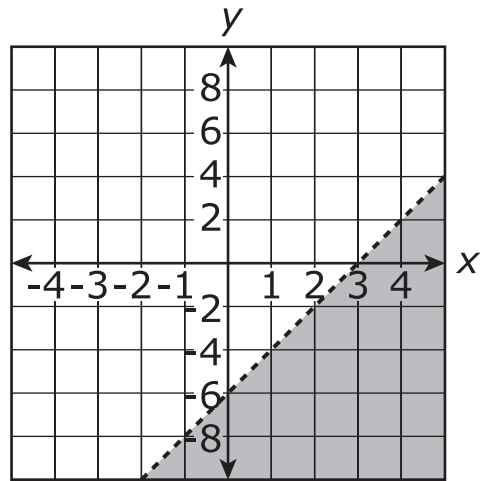
A. $R_1 = 1; \; R_{n+1} = R_n + 1$

B. $R_1 = 1; \; R_{n+1} = R_n + 2$

C. $R_1 = 1; \; R_{n+1} = 2R_n - 1$

D. $R_1 = 1; \; R_{n+1} = 2R_n + 1$

00. Which graph shows the solution of the inequality $2x - y > 6$?
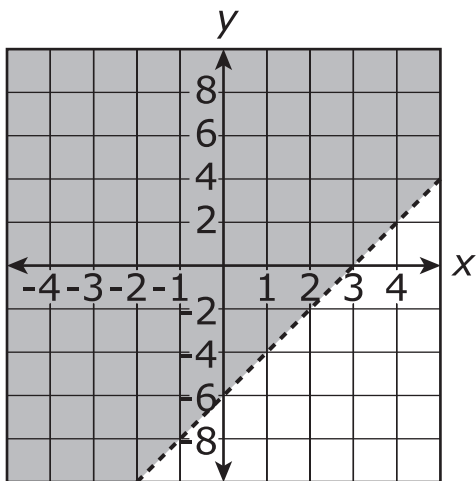
A.

C.

B.

D.

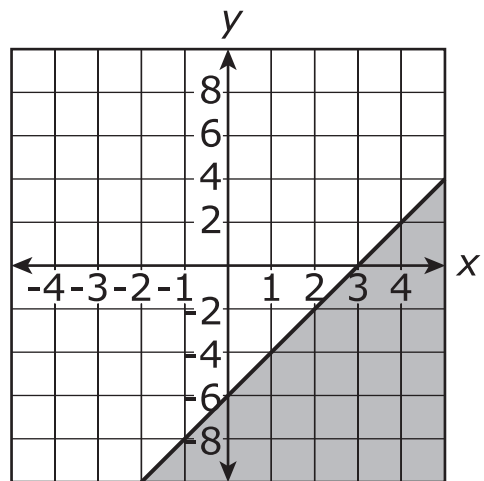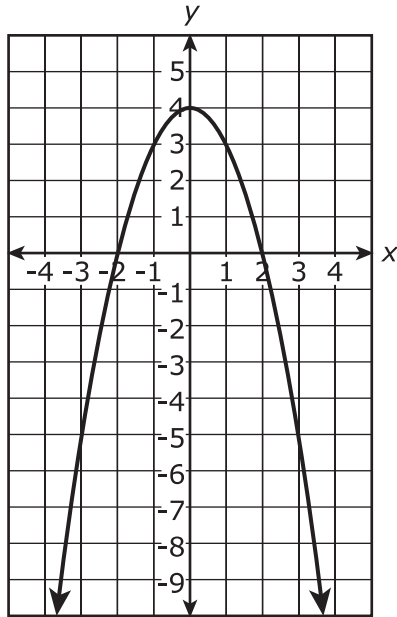**00.** Rajesh bought four pens and two notebooks for $4. Henrietta bought two pens and four notebooks for $3.50.

Which system of equations can be used to find the cost, p, of a pen and the cost, n, of a notebook?

A. $\begin{cases} 4p + 4 = 2n \\ 2p + 3.50 = 4n \end{cases}$

B. $\begin{cases} 4p + 2n = 4 \\ 2p + 4n = 3.50 \end{cases}$

C. $\begin{cases} 4p + 4n = 6 \\ 3.50p + 3.50n = 6 \end{cases}$

D. $\begin{cases} 4p + 2p = 4 \\ 2n + 4n = 3.50 \end{cases}$

00. Consider the graph shown.

Which statements are true for the graph?

Select **all** that apply.

A. The graph does not represent a function.

B. The domain is the set of all real numbers.

C. The range is the set of all real numbers.

D. An input of 1 results in an output of 3.

E. An input of −1 results in an output of 3.

F. An input of 4 results in an output of 0.

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