# Tennessee Comprehensive Assessment Program

# TCAP

## Algebra II
## Item Release

# Metadata- Math

## Items

| Page Number | UIN | Grade | Item Type | Key | DOK | TN Standards | Calculator |
|---|---|---|---|---|---|---|---|
| 4 | TN0001704 | Algebra II | MC | B | 2 | A2.F.BF.A.2 | Y |
| 5 | TN0001722 | Algebra II | MC | B | 2 | A2.F.BF.B.4a | Y |
| 6 | TN0031939 | Algebra II | MC | B | 2 | A2.A.APR.A.1 | N |
| 7 | TN0031950 | Algebra II | MS | B,E | 2 | A2.A.REI.B.3a | Y |
| 8 | TN0032247 | Algebra II | MC | D | 2 | A2.F.LE.A.1 | Y |
| 9 | TN0065816 | Algebra II | MS | C,D | 2 | A2.A.SSE.A.1 | N |
| 10 | TN0065828 | Algebra II | MC | D | 2 | A2.A.APR.C.4 | Y |
| 11 | TN0069433 | Algebra II | MS | C,D | 2 | A2.A.APR.A.2 | Y |
| 12 | TN0069438 | Algebra II | MC | A | 2 | A2.F.TF.B.3a | Y |
| 13 | TN0069449 | Algebra II | MC | A | 2 | A2.S.CP.B.6 | Y |
| 14 | TN0069486 | Algebra II | MC | B | 2 | A2.F.IF.B.3a | Y |
| 15 | TN0069519 | Algebra II | MC | B | 2 | A2.S.CP.B.5 | Y |
| 16 | TN0073698 | Algebra II | MC | C | 2 | A2.A.REI.D.6 | Y |
| 17 | TN0075305 | Algebra II | MC | C | 2 | A2.A.SSE.A.1 | N |
| 18 | TN0075354 | Algebra II | MC | B | 2 | A2.A.CED.A.2 | Y |
| 19 | TN0075718 | Algebra II | MC | C | 2 | A2.A.REI.C.4 | Y |
| 20 | TN0085446 | Algebra II | MC | D | 3 | A2.N.CN.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.<br>1 = Recall or simple reproduction of information;<br>2 = Skills and concepts: comprehension and processing of text;<br>3 = Strategic thinking, prediction, elaboration. |
| TN Standards | Primary educational standard assessed. |
| Calculator | Y for items that permit calculator use. |

**00.** The first three terms of a numerical sequence are given.

$$64, 32, 16, \ldots$$

Which formula represents the $n^{th}$ term of this sequence?

**A.** $a_n = \left(\dfrac{1}{2}\right) 64^{n-1}$

**B.** $a_n = 64\left(\dfrac{1}{2}\right)^{n-1}$

**C.** $a_n = n(64)^{\frac{1}{2}}$

**D.** $a_n = 64\left(\dfrac{1}{2}\right)^{n}$

**00.** Given $f(x) = 5x - 7$, what is $f^{-1}(x)$?

**A.** $f^{-1}(x) = \dfrac{1}{5}x - \dfrac{7}{5}$

**B.** $f^{-1}(x) = \dfrac{1}{5}x + \dfrac{7}{5}$

**C.** $f^{-1}(x) = -5x + 7$

**D.** $f^{-1}(x) = -7x + 5$

**00.** If $(x + 7)$ is a factor of $h(x)$, what is the remainder of $\dfrac{h(x)}{(x + 7)}$?

**A.** $-7$

**B.** 0

**C.** 1

**D.** 7

**00.** What are the solutions to this equation?

$$2x^2 - 5x = 12$$

Select the **two** that apply.

**A.** $x = -3$

**B.** $x = -\dfrac{3}{2}$

**C.** $x = \dfrac{2}{3}$

**D.** $x = \dfrac{3}{2}$

**E.** $x = 4$

**00.** Jenny is arranging rows of chairs for the student play.

- There are 7 chairs in the first row.
- Each row behind the first row has 2 more chairs than the previous row.

Which equation represents the number of chairs, *c*, in row *r*?

**A.** $c = (2 \times 7)r$

**B.** $c = 7 + 2 + r$

**C.** $c = 7 + (r - 1)$

**D.** $c = 7 + 2(r - 1)$

**00.** Which binomials are factors of the given polynomial?

$$2x^4 + 5x^2 - 12$$

Select **all** that apply.

**A.** $(x - 2)$

**B.** $(x + 2)$

**C.** $(x^2 + 4)$

**D.** $(2x^2 - 3)$

**E.** $(2x^2 + 3)$

**00.** Given: $\dfrac{x^2 - 16}{x^3 + 64}$

Which expression is equivalent to the given expression, if the denominator does not equal 0?

**A.** $\dfrac{1}{x - 4}$

**B.** $\dfrac{1}{x + 4}$

**C.** $\dfrac{x + 4}{x^2 - 4x + 16}$

**D.** $\dfrac{x - 4}{x^2 - 4x + 16}$

**00.** The equation of a function is shown.

$$y - 10 = -\frac{1}{3}x^2 + \frac{1}{3}x$$

Which statements correctly describe the zeros and shape of the graph of the function?

Select the **two** that apply.

**A.** The zeros of the function are $(0, -5)$ and $(0, 6)$.

**B.** The zeros of the function are $(5, 0)$ and $(-6, 0)$.

**C.** The zeros of the function are $(-5, 0)$ and $(6, 0)$.

**D.** The graph is a parabola that opens downward.

**E.** The graph is a parabola that opens upward.

**00.** What are the values of $\sin \theta$ and $\cos \theta$ when $\theta = \dfrac{7\pi}{6}$?

**A.** $\sin \theta = -\dfrac{1}{2}$ and $\cos \theta = -\dfrac{\sqrt{3}}{2}$

**B.** $\sin \theta = -\dfrac{\sqrt{3}}{2}$ and $\cos \theta = -\dfrac{1}{2}$

**C.** $\sin \theta = -\dfrac{1}{2}$ and $\cos \theta = \dfrac{\sqrt{3}}{2}$

**D.** $\sin \theta = \dfrac{1}{2}$ and $\cos \theta = -\dfrac{\sqrt{3}}{2}$

**00.** A farmer has some cows and horses. All the animals are either brown or black. The table shows how many of each animal is on the farm.

## Farm Animals

|        | Brown | Black |
|--------|-------|-------|
| **Cows**   | 3     | 5     |
| **Horses** | 4     | 8     |

One animal is selected randomly. What is the probability of choosing an animal that is black or of choosing a cow?

**A.** 0.80

**B.** 0.65

**C.** 0.40

**D.** 0.20

**00.** A function $k(x)$ is defined as $k(x) = \sqrt{2-x}$. What is the domain of $k(x)$?

**A.** $(-\infty, -2]$

**B.** $(-\infty, 2]$

**C.** $[-2, \infty)$

**D.** $[2, \infty)$

**00.** A counselor determined that 60% of the senior class had taken a precalculus course and that 15% of the senior class had taken both a precalculus course and a statistics course. What percentage of seniors who took a precalculus course also took a statistics course?

**A.** 9%

**B.** 25%

**C.** 45%

**D.** 75%

**00.** The given functions will be graphed on a coordinate plane.

$$f(x) = 3\log(x+2) \quad g(x) = x^3 - 2x^2 - 5x - 1$$

Which statement describes the relationship between the graphs of the two functions and the solutions to the equation $3\log(x+2) = x^3 - 2x^2 - 5x - 1$?

**A.** The solutions are the $x$-intercepts of the graphs.

**B.** The solutions are the $y$-intercepts of the graphs.

**C.** The solutions are the $x$-coordinates of the points of intersection of the graphs.

**D.** The solutions are the $y$-coordinates of the points of intersection of the graphs.

**00.** Which expression is equivalent to $\dfrac{2n^4 - 1}{n^4 + 3}$ if the denominator does not equal 0?

**A.** $\dfrac{2n^4}{n^4} - \dfrac{1}{3}$

**B.** $\dfrac{n^4 + 3}{n^4 + 3} + \dfrac{n^4 - 2}{n^4 + 3}$

**C.** $\dfrac{2n^4 + 6}{n^4 + 3} - \dfrac{7}{n^4 + 3}$

**D.** $\dfrac{2n^4 - 1}{n^4} + \dfrac{2n^4 - 1}{3}$

**00.** The number of hours, $t$, it takes a boat to travel 15 miles upstream is represented by the given equation.

$$t = \frac{15}{r - c}$$

Which equation represents the rate of the current, $c$, in terms of $r$, the rate of the boat, and $t$?

**A.** $c = \dfrac{15 - rt}{t}$

**B.** $c = \dfrac{rt - 15}{t}$

**C.** $c = -15 + r + t$

**D.** $c = 15 - r - t$

**00.** A system of equations is given.

$$\begin{cases} 3x + y = 6 \\ 6x - y + 4z = 13 \\ 7x + 2z = 7 \end{cases}$$

What is the *x*-value of the solution to the system?

**A.** 9

**B.** 7

**C.** −1

**D.** −5

**00.** If $f(x) = x^5 - 4x^2$, then $f(i)$ is equivalent to which expression?

    **A.** $-4 - i$

    **B.** $-4 + i$

    **C.** $4 - i$

    **D.** $4 + i$

**This page intentionally left blank.**

Tennessee Comprehensive
Assessment Program TCAP
Algebra II
Item Release

Spring 2021

**TN** Department of
**Education**