

# Tennessee Comprehensive Assessment Program

# TCAP

## Algebra II Item Release



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

64, 32, 16, . . .

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

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

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

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

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

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

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

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

**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  $\frac{h(x)}{(x + 7)}$ ?

**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.**  $x = -\frac{3}{2}$

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

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

**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:  $\frac{x^2 - 16}{x^3 + 64}$

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

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

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

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

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



- 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  $\theta = \frac{7\pi}{6}$ ?

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

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

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

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

- 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  $\frac{2n^4 - 1}{n^4 + 3}$  if the denominator does not equal 0?

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

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

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

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

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

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

**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.**  $4 + i$

## 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:

<b>UIN</b>	Unique letter/number code used to identify the item.
<b>Grade</b>	Grade level or Course.
<b>Item Type</b>	Indicates the type of item. MC= Multiple Choice; MS= Multiple Select
<b>Key</b>	Correct answer. This may be blank for constructed response items where students write or type their responses.
<b>DOK</b>	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.
<b>TN Standards</b>	Primary educational standard assessed.
<b>Calculator</b>	Y for items that permit calculator use.