

College Algebra

1. What is the next term in the geometric sequence $16, -4, 1, -\frac{1}{4}, \dots$?
- A. $-\frac{1}{8}$
B. 0
C. $\frac{1}{16}$
D. $\frac{1}{8}$
E. $\frac{1}{2}$
2. A manufacturing company processes raw ore. The number of tons of refined material the company can produce during t days using Process A is $A(t) = t^2 + 2t$ and using Process B is $B(t) = 10t$. The company has only 7 days to process ore and must choose 1 of the processes. What is the maximum output of refined material, in tons, for this time period?
- A. 8
B. 10
C. 51
D. 63
E. 70
3. For the 2 functions, $f(x)$ and $g(x)$, tables of values are shown below. What is the value of $g(f(3))$?

x	$f(x)$	x	$g(x)$
-5	7	-2	3
-2	-5	1	-1
1	3	2	-3
3	2	3	-5

- A. -5
B. -3
C. -1
D. 2
E. 7

4. For positive real numbers x , y , and z , which of the following expressions is equivalent to $x^{\frac{1}{2}}y^{\frac{2}{3}}z^{\frac{5}{6}}$?
- A. $\sqrt[3]{xy^2z^3}$
 B. $\sqrt[6]{xy^2z^5}$
 C. $\sqrt[6]{x^3y^2z^5}$
 D. $\sqrt[6]{x^3y^4z^5}$
 E. $\sqrt[11]{xy^2z^5}$
5. If $A = \begin{bmatrix} 2 & -4 \\ 6 & 0 \end{bmatrix}$ and $B = \begin{bmatrix} -2 & 4 \\ -6 & 0 \end{bmatrix}$, then $A - B = ?$
- A. $\begin{bmatrix} 0 & 0 \\ 0 & 0 \end{bmatrix}$
 B. $\begin{bmatrix} 1 & 0 \\ 0 & 1 \end{bmatrix}$
 C. $\begin{bmatrix} 0 & -8 \\ 0 & 0 \end{bmatrix}$
 D. $\begin{bmatrix} -4 & 0 \\ -12 & 0 \end{bmatrix}$
 E. $\begin{bmatrix} 4 & -8 \\ 12 & 0 \end{bmatrix}$
6. Listed below are 5 functions, each denoted $g(x)$ and each involving a real number constant $c > 1$. If $f(x) = 2^x$, which of these 5 functions yields the greatest value for $f(g(x))$, for all $x > 1$?
- A. $g(x) = cx$
 B. $g(x) = \frac{c}{x}$
 C. $g(x) = \frac{x}{c}$
 D. $g(x) = x - c$
 E. $g(x) = \log_c x$
7. If the function f satisfies the equation $f(x + y) = f(x) + f(y)$ for every pair of real numbers x and y , what are the possible values of $f(0)$?
- A. Any real number
 B. Any positive real number
 C. 0 and 1 only
 D. 1 only
 E. 0 only

8. The imaginary number i is defined such that $i^2 = -1$. What does $i + i^2 + i^3 + \dots + i^{49}$ equal?
- A. i
 - B. $-i$
 - C. -1
 - D. 0
 - E. 1
9. In an arithmetic series, the terms of the series are equally spread out. For example, in $1 + 5 + 9 + 13 + 17$, consecutive terms are 4 apart. If the first term in an arithmetic series is 3, the last term is 136, and the sum is 1,390, what are the first 3 terms?
- A. 3, 10, 17
 - B. 3, 23, 43
 - C. 3, $36\frac{1}{3}$, 70
 - D. 3, $69\frac{1}{2}$, 136
 - E. 3, 139, 1,251

Correct Answers for Sample College Algebra Items

Item #	Correct Answer
1	C
2	E
3	B
4	D
5	E
6	A
7	E
8	A
9	A