

Multiple Choice – Choose the best answer for each question.

- State the vertex of the parabola whose equation is $(y - 9)^2 = -4(x - 2)$.
a. $(9, -2)$ b. $(-2, 2)$ c. $(2, -2)$ d. $(2, 9)$
- Rewrite the following equation in standard form: $2y^2 + 12y - x + 2 = 0$.
a. $(y + 6)^2 = \frac{1}{2}(x - 2)$ b. $(y + 3)^2 = \frac{1}{2}(x + 7)$
c. $(y + 3)^2 = \frac{1}{2}(x + 10)$ d. $(y + 3)^2 = \frac{1}{2}(x + 16)$
- Identify the focus of $(y - 3)^2 = -8(x - 2)$.
a. $(0, 3)$ b. $(4, 3)$ c. $(2, 1)$ d. $(2, 5)$
- Identify the type of conic section from the equation: $y^2 - 4y - x^2 + 6x = 12$.
a. Circle b. Ellipse c. Parabola d. Hyperbola
- Write the equation of the parabola with vertex $(4, -2)$ and focus $(4, 4)$.
a. $(x - 4)^2 = 16(y + 2)$ b. $(y + 2)^2 = 8(x - 4)$
c. $(x - 4)^2 = 24(y + 2)$ d. $(y + 2)^2 = 12(x - 4)$
- What are the center and radius of the circle, $(x - 7)^2 + (y + 6)^2 = 4$?
a. C: $(-7, 6)$; $r = 4$ b. C: $(7, -6)$; $r = 16$ c. C: $(-7, 6)$; $r = 8$ d. C: $(7, -6)$; $r = 2$
- Write the equation of the circle with a diameter with endpoints $(6, 12)$ and $(16, -8)$.
a. $(x - 11)^2 + (y - 6)^2 = 125$ b. $(x - 11)^2 + (y + 6)^2 = 11.2$
c. $(x - 11)^2 + (y - 2)^2 = 125$ d. $(x - 11)^2 + (y - 2)^2 = 11.2$
- Identify the center and foci of the ellipse, $\frac{(x+4)^2}{16} + \frac{(y-1)^2}{36} = 1$
a. Center: $(-4, 1)$; Foci: $(-4 \pm 2\sqrt{5}, 1)$ b. Center: $(4, -1)$; Foci: $(4 \pm 2\sqrt{5}, -1)$
c. Center: $(-4, 1)$; Foci: $(-4, 1 \pm 2\sqrt{5})$ d. Center: $(4, -1)$; Foci: $(4, -1 \pm 2\sqrt{5})$
- State the length of the major and minor axes of $\frac{(x+4)^2}{16} + \frac{(y-1)^2}{36} = 1$.
a. Major: 4 b. Major: 6 c. Major: 36 d. Major: 12
Minor: 6 Minor: 4 Minor: 16 Minor: 8
- What is the slope of the asymptotes for the hyperbola: $\frac{(y+4)^2}{16} - \frac{(x+2)^2}{8} = 1$.
a. $m = \pm 2$ b. $m = \pm \frac{1}{2}$ c. $m = \pm \frac{\sqrt{2}}{2}$ d. $m = \pm \sqrt{2}$
- Identify the type of conic section from the equation: $4y^2 + 16y + 4x^2 - 24y = 12$.
a. Circle b. Ellipse c. Parabola d. Hyperbola
- What is the solution of the system of equations? $y = 2x + 1$
 $y = x^2 + 2x - 3$
a. $(0, -3)$ b. $(-1, -4)$ c. $(-3, 0)$ and $(1, 0)$ d. $(-2, -3)$ and $(2, 5)$

Multiple Choice – Choose the best answer for each question.

1. Find $7A + 6B$. $A = \begin{bmatrix} 1 & -1 \\ 0 & -3 \\ 5 & 2 \end{bmatrix}$ $B = \begin{bmatrix} -2 & 1 \\ 5 & 4 \\ 0 & -7 \end{bmatrix}$

a. $\begin{bmatrix} 19 & -13 \\ 30 & 3 \\ -35 & 56 \end{bmatrix}$ b. $\begin{bmatrix} -5 & -1 \\ 0 & 3 \\ 0 & -28 \end{bmatrix}$ c. $\begin{bmatrix} -5 & -1 \\ -30 & -45 \\ 35 & 56 \end{bmatrix}$ d. $\begin{bmatrix} -5 & -1 \\ 30 & 3 \\ 35 & -28 \end{bmatrix}$

2. Evaluate the determinant: $\begin{bmatrix} -5 & -5 & 4 \\ -5 & 4 & -1 \\ 0 & 3 & -1 \end{bmatrix}$

- a. 30 b. -50 c. -30 d. -40

3. Solve using a matrix equation: $\begin{cases} -3x + 10y = 3 \\ x - 3y = -3 \end{cases}$

- a. $x = 21$
 $y = 6$ b. $x = -6$
 $y = -21$ c. $x = -21$
 $y = -6$ d. no solution

4. Multiply: $\begin{bmatrix} -7 & 6 \\ 1 & 6 \end{bmatrix} \begin{bmatrix} -4 & 1 \\ -4 & 3 \end{bmatrix}$ a. $\begin{bmatrix} 28 & -24 \\ -7 & 18 \end{bmatrix}$ b. $\begin{bmatrix} 4 & 11 \\ 19 & -28 \end{bmatrix}$ c. $\begin{bmatrix} -4 & -24 \\ 1 & 18 \end{bmatrix}$ d. $\begin{bmatrix} 4 & 11 \\ -28 & 19 \end{bmatrix}$

5. State the dimensions of the matrix. Identify the indicated element.

$A = \begin{bmatrix} -9 & 1 \\ -7 & 5 \\ -5 & 8 \end{bmatrix}$, $a_{2,1}$

- a. $3 \times 2; 5$ c. $2 \times 3; -7$
b. $2 \times 3; 1$ d. $3 \times 2; -7$

6. Solve for t and y:

$\begin{bmatrix} -6 - t & 0 \\ 8 & -5 \end{bmatrix} = \begin{bmatrix} -5 & 0 \\ 8 & -3y - 2 \end{bmatrix}$

- a. $t = 1, y = -1$ c. $t = -1, y = 2$
b. $t = -11, y = 1$ d. $t = -1, y = 1$

7. $\begin{vmatrix} -10 & 10 \\ 5 & -7 \end{vmatrix}$ a. -120 b. 20 c. 120 d. -20

8. $\begin{bmatrix} 7 & 2 & 0 \\ -5 & 9 & 9 \end{bmatrix} - \begin{bmatrix} -1 & 3 & 8 \\ 3 & 4 & 7 \end{bmatrix}$ a. $\begin{bmatrix} 8 & 1 & -8 \\ -8 & 5 & 2 \end{bmatrix}$ b. $\begin{bmatrix} 8 & -1 & -8 \\ -8 & 5 & 2 \end{bmatrix}$ c. $\begin{bmatrix} 8 & -1 & -8 \\ 8 & -5 & 2 \end{bmatrix}$ d. $\begin{bmatrix} 8 & -1 & 8 \\ -8 & 5 & 2 \end{bmatrix}$

Triangle Trig

Multiple Choice – Choose the best answer for each question.

1. In right $\triangle ABC$, $A = 40^\circ$, $C = 90^\circ$, and $c = 17$. Find b .

- a. 12 b. 13 c. 14 d. 15

2. In right $\triangle ABC$, $a = 5$, $b = 4$, and $C = 90^\circ$. Find A .

- a. 89.606° b. 38.660° c. 60° d. 51.340°

3. From a point 20 feet in front of a tree, the angle of elevation to the top of the tree is 29.7° .

Find the height of the tree to the nearest foot.

- a. 136.1 ft b. 11 ft c. 14.7 ft d. 594 ft

4. An airplane pilot sights a life raft at a 26° angle of depression. The airplane's altitude is 3 km. What is the airplane's horizontal distance d from the raft? Round your answer to the nearest whole number.

- a. 5km b. 6km c. 4km d. 3km

5. What is the exact value of the cosine of 45° ?

- a. $\frac{\sqrt{3}}{2}$ b. 1 c. $-\frac{\sqrt{2}}{2}$ d. $\frac{\sqrt{2}}{2}$

6. What is the exact value of the sine of 120° ?

- a. $\frac{\sqrt{3}}{2}$ b. $-\frac{\sqrt{3}}{2}$ c. $\frac{1}{2}$ d. $\frac{\sqrt{2}}{2}$

7. What is the exact value of the tangent of 150° ?

- a. $-\sqrt{3}$ b. $\sqrt{3}$ c. $-\frac{\sqrt{3}}{3}$ d. $\frac{\sqrt{3}}{3}$

8. In $\triangle ABC$, $A = 40^\circ$, $b = 7.6$, and $c = 4.5$. Find a to the nearest tenth.

- a. 4.0 b. 3.0 c. 5.1 d. 4.5

9. In $\triangle ABC$, $A = 35^\circ$, $b = 5$ cm, and $c = 6$ cm. Find the area of the triangle to the nearest tenth of a cm^2 .

- a. 8.4 cm^2 b. 8.6 cm^2 c. 8.5 cm^2 d. 8.3 cm^2

10. In $\triangle ABC$, $a = 112$ cm, $b = 52$ cm, and $c = 65$ cm. Find the measure of angle A .

- a. 56° b. 124° c. 146° d. does not exist

11. A triangle has side lengths of 20 in, 24 in, and 30 in. Find the area of the triangle.

- a. 478.2 in^2 b. 239.2 in^2 c. 298.9 in^2 d. 358.6 in^2

12. In $\triangle ABC$, $C = 30^\circ$, $a = 32$, and $c = 16$. Determine how many triangles can be formed.

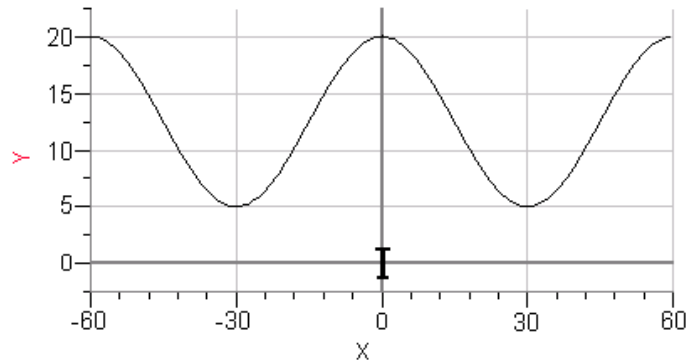
- a. one b. two c. three d. none

13. In $\triangle ABC$, $A = 30^\circ$, $B = 40^\circ$, and $a = 3$. Find the length of side b .

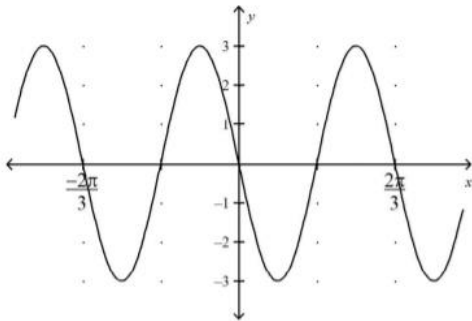
- a. $b = 3.86$ b. $b = 4.86$ c. $b = 5.64$ d. $b = 5.64$

Multiple Choice – Choose the best answer for each question.

Use the graph shown below to answer question 1 - 3.



- What is the AMPLITUDE of the graph shown?
a. 15 b. 7.5 c. 30 d. 60
- What is the PERIOD of the graph shown?
a. 15 b. 7.5 c. 30 d. 60
- What is the VERTICAL SHIFT of the graph shown?
a. 12.5 b. 5 c. 20 d. 30
- The amplitude of the graph of $y = -2\cos 3x$ is what value?
a. 2 b. -2 c. 3 d. -3
- What is the phase shift of the graph of $y = 4\sin(2x + \pi)$?
a. left π b. right π c. right $\frac{\pi}{2}$ d. left $\frac{\pi}{2}$
- Write the equation of the function shown in the graph.



- $f(t) = 3 \sin 6t$
- $f(t) = 6 \cos 3t$
- $f(t) = -3 \sin 3t$
- $f(t) = 3 \sin 3t$

- What is the period of the graph whose equation is $y = 3\cos 2\theta$?
a. 180° b. 2 c. 3 d. 360°
- What is the minimum value in the range of $y = 2\sin x + 3\theta$?
a. 1 b. 0 c. -1 d. -5
- What is the period of the graph to the right?
a. 2π b. π c. 4π d. 2
- What is the equation for the accompanying graph?
a. $y = \cos 2x$ b. $y = 2\cos x$ c. $y = \frac{1}{2}\cos x$ d. $y = \cos \frac{1}{2}x$

