

**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.  $89.606^\circ$               b.  $38.660^\circ$               c.  $60^\circ$                       d.  $51.340^\circ$

3. From a point 20 feet in front of a tree, the angle of elevation to the top of the tree is  $29.7^\circ$ .

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  $26^\circ$  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  $45^\circ$ ?

- 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  $120^\circ$ ?

- 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  $150^\circ$ ?

- 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  $\text{cm}^2$ .

- a.  $8.4 \text{ cm}^2$               b.  $8.6 \text{ cm}^2$               c.  $8.5 \text{ cm}^2$               d.  $8.3 \text{ cm}^2$

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

- a.  $56^\circ$                       b.  $124^\circ$                       c.  $146^\circ$                       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.  $478.2 \text{ in}^2$               b.  $239.2 \text{ in}^2$               c.  $298.9 \text{ in}^2$               d.  $358.6 \text{ in}^2$

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

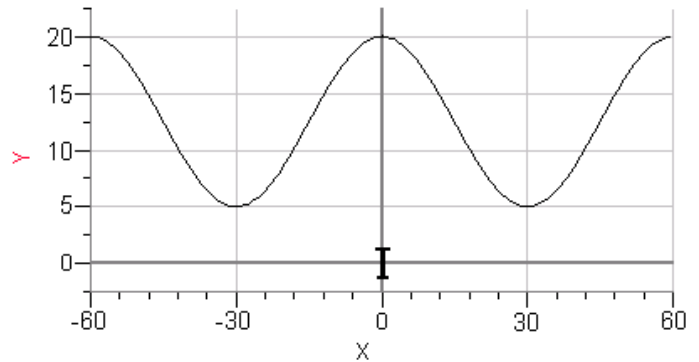
- ~~a. one                      b. two                      c. three                      d. none~~

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

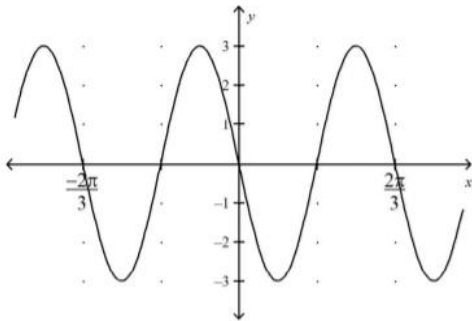
- a.  $b = 3.86$                   b.  $b = 4.86$                   c.  $b = 5.64$                   d.  $b = 5.64$

**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  $\pi$     b. right  $\pi$     c. right  $\frac{\pi}{2}$     d. left  $\frac{\pi}{2}$
- Write the equation of the function shown in the graph.



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

7. What is the period of the graph whose equation is  $y = 3\cos 2\theta$ ?

- a.  $180^\circ$     b. 2    c. 3    d.  $360^\circ$

8. What is the minimum value in the range of  $y = 2\sin x + 3$ ?

- a. 1    b. 0    c. -1    d. -5

9. What is the period of the graph to the right?

- a.  $2\pi$     b.  $\pi$     c.  $4\pi$     d. 2

10. 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.  $y = \cos \frac{1}{2}x$

