Answer all items. Place the letter of the correct answer on the answer sheet. All items on Part I have a value of one point.

1. Which of the following angles has the same value of sine as 72^0?

   a. 18^0
   b. 108^0
   c. 252^0
   d. 288^0

2. Which of the following is the solution for the system of equations: $\begin{cases} 2x + 3y = 8 \\ 5x - 2y = 1 \end{cases}$?

   a. (1, 2)
   b. (-2, 4)
   c. (3, 7)
   d. (2, 1)

3. What is the determinant of the matrix $\begin{pmatrix} 3 & 5 \\ 2 & 4 \end{pmatrix}$?

   a. -2
   b. 2
   c. 7
   d. 22

4. What is the inverse of the matrix: $\begin{pmatrix} 5 & 7 \\ 3 & 4 \end{pmatrix}$?

   a. $\begin{pmatrix} 4 & -7 \\ -3 & 5 \end{pmatrix}$
   b. $\begin{pmatrix} -4 & 7 \\ 3 & -5 \end{pmatrix}$
   c. $\begin{pmatrix} -5 & 3 \\ 7 & -4 \end{pmatrix}$
   d. $\begin{pmatrix} 5 & -3 \\ -7 & 4 \end{pmatrix}$

5. Which of the following statements is not true for a matrix with a determinant of zero?

   a. The matrix contains the coefficients of equations of parallel lines.
   b. The matrix has no inverse.
   c. The system of equations represented by the matrix has no solution.
   d. The matrix contains only zeros.

6. What is the y-intercept of the plane described by the equation: $3x - 2y + 4z = -12$

   a. -6
   b. -2
   c. 2
   d. 6

7. Which of the following equations represents an internet rate plan which costs $10 per month and 50¢ per hour?

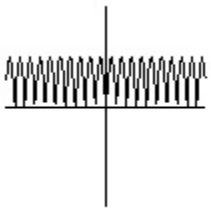
   a. $y = 10x + 0.50$
   b. $y = 0.50x + 10$
   c. $y = 10x + 50$
   d. $y = 50x + 10$

8. Which of the following best describes the graph of an equation with three variables?

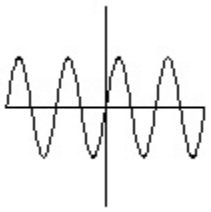
   a. point
   b. line
   c. plane
   d. 3 intersecting lines

9. Which of the following graphs shows a sinusoidal function?

a.

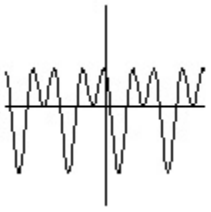


b.



c.

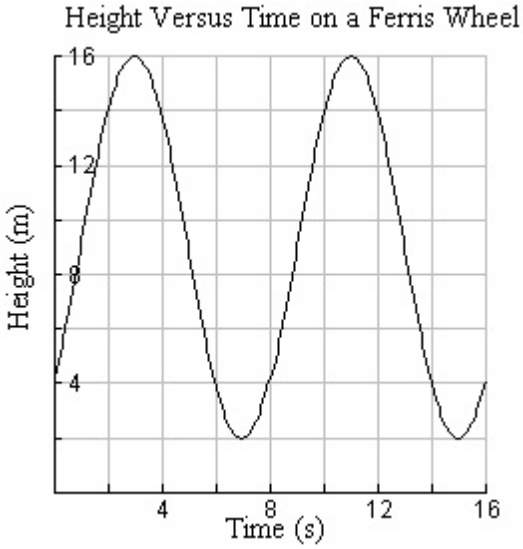
d.



10. What is the least number of equations needed to solve a system of equations containing four variables?

a. 2
b. 3
c. 4
d. 5

The graph below shows Bob's height on a Ferris wheel over a period of time. Use this graph to answer questions 17 - 20.



11. How far is the bottom of the Ferris wheel above the ground?

    a. 2 m
    b. 4 m
    c. 9 m
    d. 16 m

12. What is the radius of the Ferris wheel?

    a. 7 m
    b. 8 m
    c. 14 m
    d. 16 m

13. How long does it take the Ferris wheel to make one complete revolution?

    a. 3 s
    b. 4 s
    c. 7 s
    d. 8 s

14. What is the height of the Ferris wheel at a time of 11 s?

a. 11 m
b. 12 m
c. 14 m
d. 16 m

15. What is the exact value of $\sin 210^0$?

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

16. Which of the following pairs of angles represents coterminal angles?

a. 58^0, 238^0
b. -20^0, 160^0
c. -65^0, 295^0
d. 50^0, 330^0

17. Which of the following mapping rules represents the transformation for the equation $y = 2\sin(x - 10) + 3$?

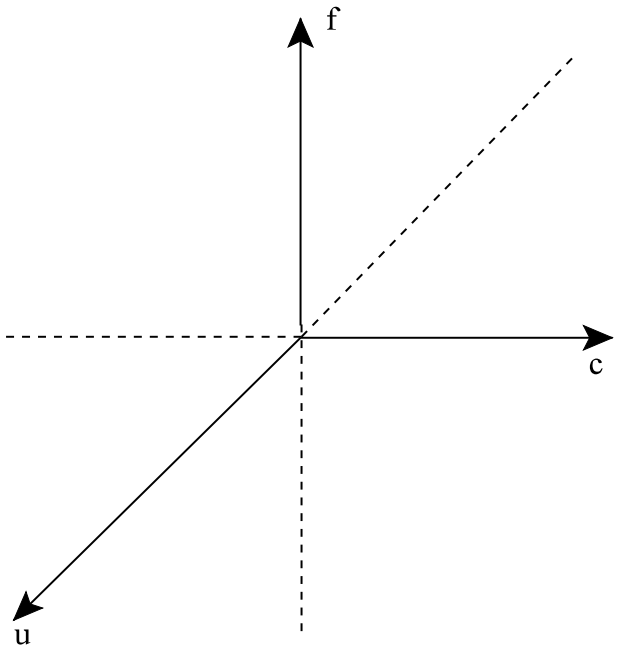
a. $(x, y) \rightarrow (x + 10, 2y + 3)$
b. $(x, y) \rightarrow (x - 10, 2y - 3)$
c. $(x, y) \rightarrow (x + 10, \frac{1}{2}y + 3)$
d. $(x, y) \rightarrow (x - 10, \frac{1}{2}y - 3)$

18. What is the equation of the sinusoidal axis of the equation $y = 2\sin 3(x - 4) - 3$

a. $y = 3$
b. $y = 4$
c. $y = -3$
d. $y = 2$

Answer **ALL** items in the space provided. Show **ALL** workings

35. Sketch the graph of $-3u - 3c + 4f = 12$ on the axes below.



36. Find the inverse of the matrix below. Be sure to show your workings. DO NOT use the graphing calculator!

$$\begin{pmatrix} 3 & 4 \\ 2 & 2 \end{pmatrix}$$

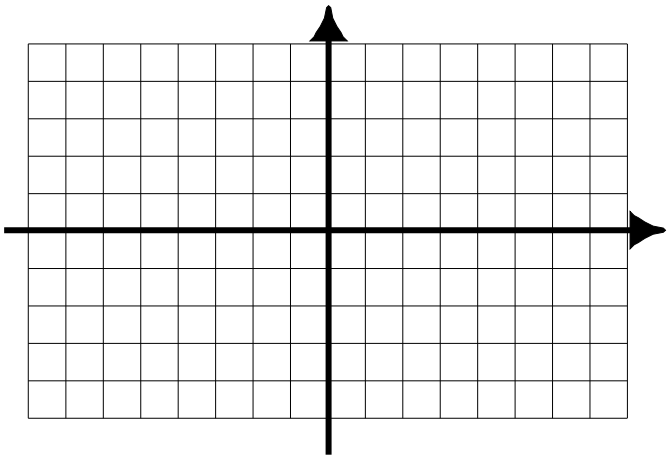
37. A phone company charges different rates for Canadian calls, US calls and overseas calls. Use the data provided in the table below to find the three rates. Show ALL your workings. You may use the graphing calculator for this question.

Time within Canada (min)	Time to the US (min)	Time overseas (min)	Charges ($)
25	15	18	10.74
20	24	15	10.92
35	30	35	19.40

38. Solve the following system of equations without using the graphing calculator.

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

39. Sketch the graph of the following sinusoidal function below: $2(y + 1) = \sin(x + 45)$



40. Determine the equation of the sinusoidal function shown on the graph below. **(5%)**