Final Exam June - 04

1. ? is the equation that relates cost (C) to distance(d) for "Short-Haul Trucking" if there is a basic charge of $10.00 and a charge of $0.15 per kilometer ? .

A) y = C + d B) y = 10 d + C C) C = 0.15d + 10 D) C = 10d +15

2. The equation for the charges of a long distance phone company is ? , if the basic monthly charge is $18.00, the charge for local call is $0.11 per minute and $0.55 per minute for calls to the U.S. (C = charge , L =number of minutes of local calls and U = number minutes in calls to the U.S.)

A) C = 18 + 11 L + 0.55 U B) C = 18 + 0.11 L + 0.55 U C) 18 = C + L + U D) 18 + 0.11 + 0.55 = C + L + U

3. The z-intercept of 5x + 20y - 4z = 20 is ? .

A) (5, 20, -4) B) (4, 1, -5) C) (0, 0, z) D) (0, 0, -5)

4. ? is the sum of the first equation and the second. $\begin{cases} x + y = 4 \\ -x - 2y = 2 \end{cases}$

A) 2x = 2 B) x(-x) + y(2y) = 6 C) - y = 6 D) cannot add equations

5. For the system $\begin{cases} x + 3y = 3 \\ 2x - y = -2 \end{cases}$, the corresponding matrix equation is ? .

A) $\begin{pmatrix} 1 & 3 \\ 2 & -1 \end{pmatrix}\begin{pmatrix} 3 \\ -2 \end{pmatrix} = \begin{pmatrix} x \\ y \end{pmatrix}$ B) $\begin{pmatrix} x \\ y \end{pmatrix}\begin{pmatrix} 1 & 3 \\ 2 & -1 \end{pmatrix} = \begin{pmatrix} 3 \\ -2 \end{pmatrix}$ $\begin{pmatrix} x \\ y \end{pmatrix} = \begin{pmatrix} 3 \\ -2 \end{pmatrix}\begin{pmatrix} 1 & 3 \\ 2 & -1 \end{pmatrix}$ $\begin{pmatrix} 1 & 3 \\ 2 & -1 \end{pmatrix}\begin{pmatrix} x \\ y \end{pmatrix} = \begin{pmatrix} 3 \\ -2 \end{pmatrix}$ D)

6. ? is the determinant of $\begin{pmatrix} 1 & -2 \\ 2 & -3 \end{pmatrix}$ A) 1 B) 0 C) - 7 D) (1) (- 3) (2) (-2)

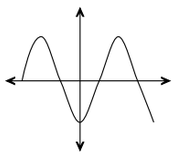
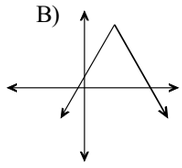
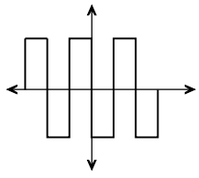
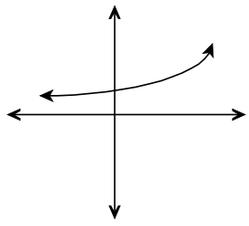
7. The "curved" graph equation which we have used to generate systems of equations is ? .

A) y = ax + b B) y = mx + b C) z = ax + by + c D) $y = ax^2 + bx + c$

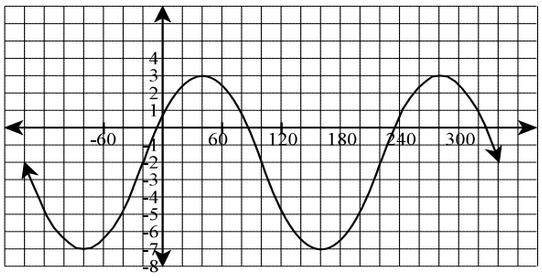
8. If (2, 5) is a point on a curved graph, then ? is the equation it will generate.

A) 4a +2b + c = y B) 5 = 4a +2b + c C) y = 2x +5 D) 0 = 2x + 5y

9. ? is a graph which is sinusoidal.

A)  B)  C)  D) 

USE THE FOLLOWING GRAPH FOR QUESTIONS 10, 11, and 12.



10 The period is ? degrees .

A) 60 B)120 C) 180 D) 240

11. The sinusoidal axis is ? .

A) y = -7 B) y = 3 C) x-axis D) y = - 2

12. ? is the amplitude.

A) 10 B) 5 C) 3 D) - 7

13. The function form of $3(y - 2) = \cos x$ is ? .

A) $y = -3\cos\left(x - \frac{1}{2}\right)$ B) $y = \frac{1}{3}\cos(x + 2)$ $y = \frac{1}{3}\cos x + 2$ $y = 3\cos x - 2$ D)

14. The horizontal (x-axis) distance between consecutive maximums is a way to find ? .

A) sinusoidal axis B) period C) amplitude D) horizontal translation

15. The mapping notation for $2(y + 3) = \cos\frac{1}{2}(x + 60)$ is ? .

A) $(x, y) \rightarrow (2x + 60, \frac{1}{2}y + 3)$ B) $(x, y) \rightarrow (\frac{1}{2}y - 3, 2x - 60)$

C) $(x, y) \rightarrow (2x - 60, \frac{1}{2}y - 3)$ D) $(x, y) \rightarrow (-2x - 60, -\frac{1}{2}y - 3)$

16. On a **unit circle** , the "x-coordinate" is the ? of the angle of rotation.

A) cosine B) sine C) tangent D) A or B

17. ? is co-terminal with 10º.
A) 80º B) - 230º C) -80º D) 730º

18. The conversion to degrees of $\frac{-\pi}{2}$ is ? degrees.
A) -300 B) -270 C) -90 D) none of these

19. Cos(150º) = ? .
A) $\frac{-\sqrt{2}}{2}$ B) $\frac{-\sqrt{3}}{2}$ C) $\frac{\sqrt{3}}{2}$ D) $\frac{\sqrt{2}}{2}$

20. The conversion for $\frac{5\pi}{9}$ is ? degrees .
A) 100 B) $\frac{\sqrt{2}}{2}$ C) 200 D) $\frac{5(3.14)}{9}$

21. θ = ? are the solution(s) fc $1-2\sin\theta = 2, 0^o \le \theta < 360^o$ (i.e. one revolution).
A) $210^o,\ 330^o$ B) $\frac{7\pi}{6}, \frac{11\pi}{6}$ C) $210^o + 360^o n, n \in \Re$ D) no solution

22. When $(\sec x)(\sin^2 x)(\cot^2 x)$ is simplified the result is ? .
A) tan x B) sec $\sin^2$ $\cot^2$ x C) cos x D) 1

23. The area of a triangle with sides of 4 cm, 8 cm, and an included angle of 80º is ? cm^2 .
A) (0.5)(4)(8) B) 16.0 C) 2.7 D) 15.8

24. If we know the lengths of two legs (short sides) in a right triangle we can find the hypotenuse by using the ? .
A) area formula B) sine function
C) law of sines D) law of cosines

25. A triangle has sides of length 7m, 10m, and 12 m. The smallest angle has a measure of ? degrees.
A) 36 B) 56 C) 88 D) 21

26. The following is an example of a ? sample:
A survey is given to all Regina students and is used to represent all students in grades 10 to 12 in Newfoundland..
A) cluster B) convenience C) systematic D) self selected

27. ? is the formula used to find a 95% confidence intervals for a sample of 20 with a mean of 10 and the standard deviation is 12 .

A) $10 \pm (196)\frac{20}{\sqrt{10}}$ B) $10 \pm (1.96)\frac{12}{\sqrt{20}}$

C) $20 \pm (1.96)\frac{10}{\sqrt{12}}$ D) $12 = \frac{20}{\sqrt{10}}$

28. A sample of the I.Q.'s of people in a class found that the mean was 100 and the standard deviation was 10. An "approximate" 95% confidence interval is ? .
A) (75, 125) B) (90, 110) C) (80, 120) D) (84, 116)

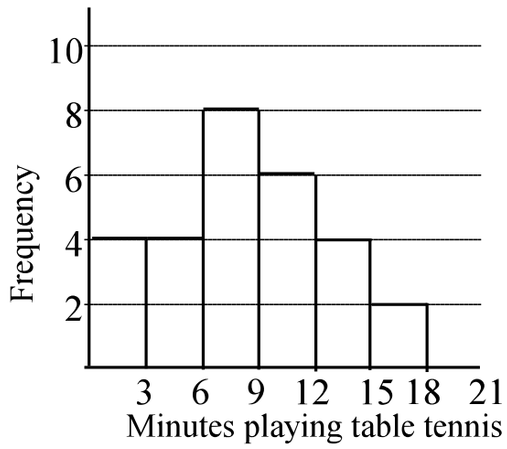
Use the following Graph for #29 and #30. The graph shows a sample of the number of people who play a certain number of minutes of table tennis each lunch time at Regina

29. ? is the number of students sampled.
A) 28 B) 6
C) 7 C) 8

30. ? is the percentage of people who play over 12 minutes.

A) 14% B) $\frac{6}{28}$

C) 21% D) $\frac{4}{28}$

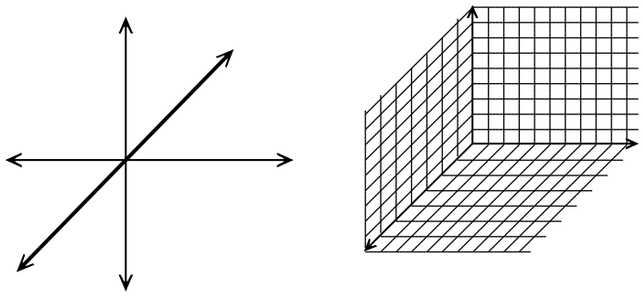


Part II - Long Answer [70% total]
Show all necessary workings in the space provided

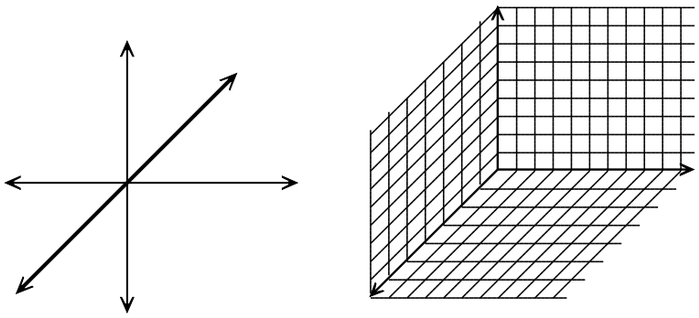
1. Describe each plane. (Do not graph it) [1 mark each]
a) 6x =12 b) 8x - 5y = -40z

2. Sketch each plane (use whichever grid you find most useful)

a) 5x - 10y + 6z = 30 [2 marks]



b) 2x + 3y - z = 0 [2 marks]



3. a) What is the x-y trace of 10x + 7y - 4z = 34 ? [2 marks]

4. Solve each system .
a) use substitution, matrices, or elimination. [2 marks]

$$\begin{cases} 2x + y = 1 \\ x - y = 2 \end{cases}$$

#4 continued
b) solve by using elimination or substitution.[3 marks]

$$\begin{cases} 2x + y + z = 7 \\ x - y + 3z = 8 \\ 3x - 2y + z = 2 \end{cases}$$

5. A dog is jumping off a table through a hoop. Fluffy leaves the 1m high table, goes through a 3m high hoop that is 2m from the table and then lands on the ground 3 m from the table. [Hint: sketch the situation described]

a) i) the independent variable is:_____ ii) the dependent variable is:_____

b) the three coordinates to be used in the "curved equation" are, [2 marks]

(,) (,) (,)

c) If the point (4, -3) was substituted into the curved equation formula, what would be the equation that would be generated? [2 marks]

6. a) Put in FUNCTION FORM [1 mark] b) Put in TRANSFORMATIONAL FORM [1 mark]

$\frac{1}{3}(y+5)) = \cos 7(x-8)$ $y = 2\sin 4(x-2) - 5$

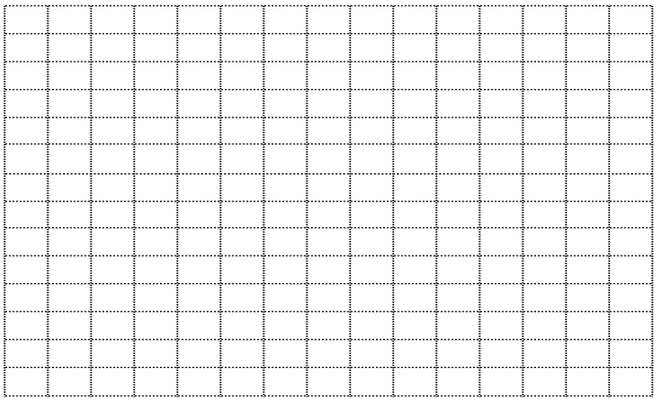
7. Complete the mapping notation for each. [3 marks total]

i) $-3(y+2) = \sin\frac{3}{5}(x-4)$ iii) $y = 2\sin 3(x-5) - 7$ [2 marks]

$(x,y) \rightarrow (\quad , \quad)$ $(x,y) \rightarrow (\quad , \quad)$

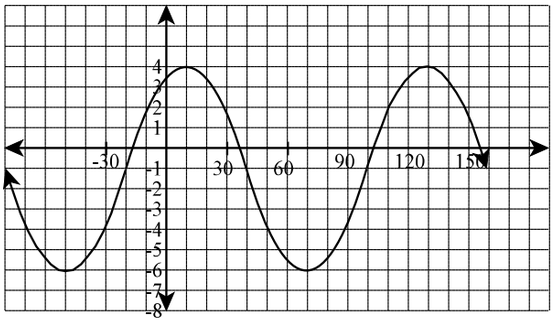
8. Graph the following. [4 marks]

$\frac{1}{2}(y+1) = \sin 2(x-10)$



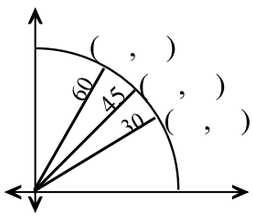
9. Find the equation in each of the following.

a) as a SINE or COSINE. [4 marks]



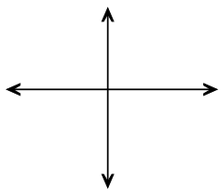
b) Find the equation that relates the height of a beach ball and time. A bouncing beach ball(that continues to bounce, over and over) is at a maximum height of 8 m, 3s after a sunbather notices it. The ball is half way to the ground 2s later (i.e. 2s after it has reached a maximum height). [4 marks]

10. Fill in the EXACT coordinates of first quadrant of the unit circle.[2 marks]

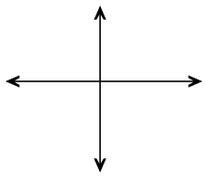


11. Sketch each angle in standard position. [1 mark each]

a) -200°



b) $\frac{3\pi}{7}$



12. a)Find one positive co-terminal angle. [1 mark] b)Find one negative co-terminal angle. [1 mark]

230°

$\frac{11\pi}{6}$

13. Find the EXACT value of each.

a) $\frac{\sin 210^\circ}{\cos^2 45^\circ}$ $\cos(-180^\circ) + \sin 45^\circ$

14. Prove:

$\csc\theta(\sin\theta + \cos\theta) = 1 + \cot\theta$

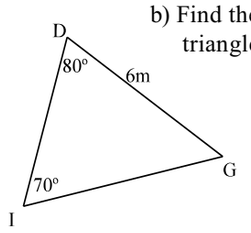
15. Find ALL solutions (in degrees)for

$4\sin\theta + 3 = 0$

16. Do each of the following. [10 marks total]

a)Find the area of a triangular dog pen if two of the fence sections are 8 m and 10m long and form an angle of 88°.

b) Find the length of side "d" in the following triangle.



c) Find the measure of the angle across from the largest side of a triangle with side lengths of 6 cm, 7 cm, and 11 cm. [4 marks]

17 . A set of sample data is { 2, 5, 11}.
Find the he standard deviation. [2 marks]

18. a)Mr. Matthews wanted to borrow some money because he was retiring. He sampled 16 students in his home room and found that they had an average of $8.35 in their pocket with a standard deviation of $4.20. What is a 90% confidence interval for his home room?

b) What does this confidence interval mean? [1 mark]