

SCHOOL PERIOD: 2017 – 2018 LEARNING INTEGRATIVE PRODUCT OF MATHEMATICS II MADE BY: ACADEMIA DE MATEMÁTICAS ACADEMY COORDINATOR: MTRA. ADRIANA I. GARZA CERVANTES EDUCATIVE PROGRAM: BILINGUAL	SEMESTER: JANUARY – JUNE 2018 DATE: MAY 2018 SECOND SEMESTER
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NAME: _____			
GROUP: _____	ROLL: _____	GRADE _____	
COEVALUATION MADE BY: _____			

### STAGE 1.

**INSTRUCTIONS:** Solve each of the following exercises correctly (answers are not valid without procedure).

1. Calculate "x" values for expression  $|3x + 5| + 7 = 24$

- a)  $\left\{4, \frac{22}{3}\right\}$       b)  $\left\{4, -\frac{22}{3}\right\}$       c)  $\left\{-4, \frac{22}{3}\right\}$       d)  $\left\{-4, -\frac{22}{3}\right\}$

2. What constant is missing in expression  $x^2 - 18x + \underline{\hspace{1cm}}$ , to be a perfect square trinomial?

- a) 9      b) -9      c) -81      d) 81

3. Solve equation  $(3x + 6)^2 = 25$

- a)  $x_1 = 3$   
 $x_2 = -6$       b)  $x_1 = -1/3$   
 $x_2 = -11/3$       c)  $x_1 = -19/3$   
 $x_2 = 31/3$       d)  $x_1 = 19$   
 $x_2 = -31$

4. Determine roots of equation  $x^2 + 10x + 25 = 49$

- a)  $x_1 = 2$   
 $x_2 = -12$       b)  $x_1 = -2$   
 $x_2 = 12$       c)  $x_1 = 2$   
 $x_2 = 12$       d)  $x_1 = 1$   
 $x_2 = 14$

5. A width section of a rectangular piece has 2 m less than its large segment and its area is  $120\text{m}^2$ . Find its perimeter.

- a)  $P = 10m$       b)  $P = 12m$       c)  $P = 44m$       d)  $P = 22m$

### STAGE 2.

**INSTRUCTIONS:** Solve each of the next problems of Plane Geometry correctly.

6. Transform  $125^\circ$  in radians.

- a)  $\frac{25}{36}\pi \text{ rad}$       b)  $\frac{2}{3}\pi \text{ rad}$       c)  $\frac{36}{25\pi} \text{ rad}$       d)  $\frac{125}{180\pi} \text{ rad}$

7. Convert  $\frac{49}{9}\pi$  rad in sexagesimal degrees

- a)  $17^\circ 50''$       b)  $171^\circ$       c)  $240^\circ$       d)  $980^\circ$

8. A metal nut has to turn 30 cm from point A to point B, if it is known that its radius is 22 cm, determine how many degrees the metal nut will turn in **decimal degrees**.

- a)  $1.3636^\circ$       b)  $48.68^\circ$       c)  $78.1^\circ$       d)  $42.24^\circ$

9. How many degrees does a circle have to rotate to travel 2 meters in a freeway if the circle has 1 meter of radius?

- a)  $114^\circ 35' 28.65''$     b)  $57^\circ 17' 44.32''$     c)  $78^\circ 10' 23.5''$     d)  $42^\circ 24'$

10. Consider A and B are two conjugated angles. If  $A = 12(2x + 4)^\circ$  and  $B = 6(25 - x)^\circ$ , calculate the measure of angle A.

- a)  $235^\circ$       b)  $156^\circ$       c)  $174^\circ$       d)  $264^\circ$

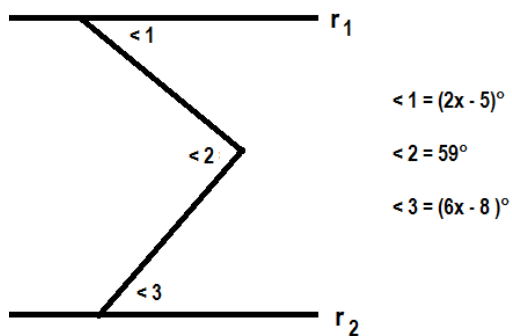
11. Complement of  $65^\circ 43' 21''$

- a)  $5^\circ 43' 21''$       b)  $24^\circ 16' 39''$       c)  $114^\circ 16' 39''$       d)  $294^\circ 16' 39''$

12. If A and B two supplementary angles where  $A = 3(2x + 4)^\circ$  and  $B = 5(2x + 6)^\circ$ , determine the value of angle B.

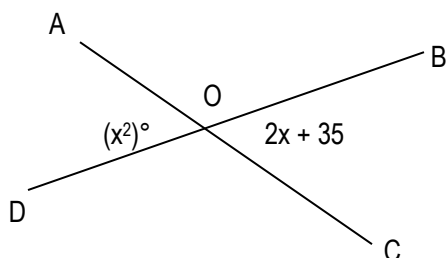
- a)  $116.25^\circ$       b)  $63.75^\circ$       c)  $110^\circ$       d)  $255^\circ$

13. Find the measure of angle 3 in next figure, consider  $r_1 \parallel r_2$ :



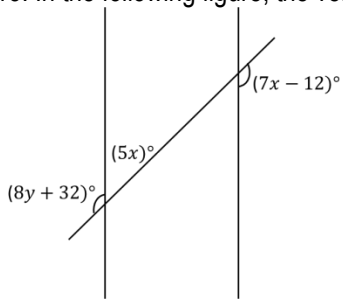
- a)  $9^\circ$       b)  $25^\circ$       c)  $46^\circ$       d)  $90^\circ$

14. Determine the measure of angle DOC in the next figure,  $x > 0$



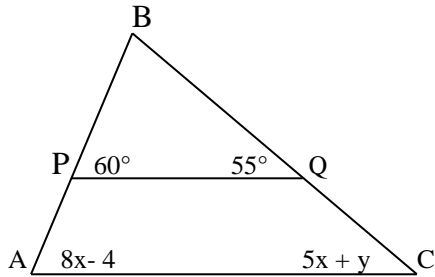
- a)  $49^\circ$       b)  $7^\circ$       c)  $131^\circ$       d)  $180^\circ$

15. In the following figure, the vertical lines are parallels. Determine the value of "y".



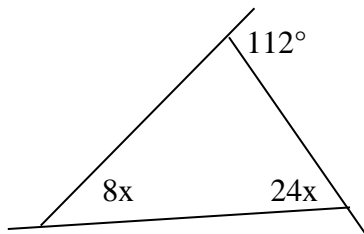
- a)  $y = 7$                       b)  $y = 16$                       c)  $y = 8$                       d)  $y = 12$

16. Find the value of "y" in next figure considering  $\overline{PQ} \parallel \overline{AC}$ .



- a)  $y = -8$                       b)  $y = 5$                       c)  $y = -7$                       d)  $y = 15$

17. In next figure, calculate the value of "x".



- a)  $x = 3.5$                       b)  $x = 4$                       c)  $x = 10$                       d)  $x = 9$

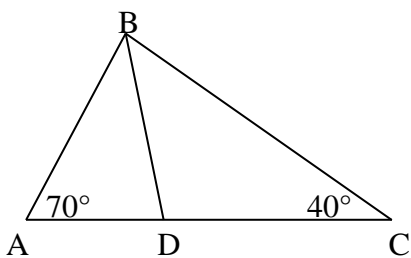
18. In a triangle, one of its interior angles measure  $75^\circ$  and the rest are at ratio 3:4. The measure of the mayor angle is:

- a)  $60^\circ$                       b)  $2.14^\circ$                       c)  $30^\circ$                       d)  $40.7^\circ$

19. In a triangle, its interior angles are  $\angle A = (3x - 5)^\circ$ ,  $\angle B = (8x - 2)^\circ$ , and  $\angle C = (11x + 11)^\circ$ , determine the value of angle B

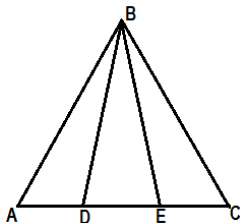
- a)  $60^\circ$                       b)  $62^\circ$                       c)  $19^\circ$                       d)  $99^\circ$

20. In next figure, line segment  $\overline{BD}$ , is a bisector of angle B. Calculate the measure of angle ADB.



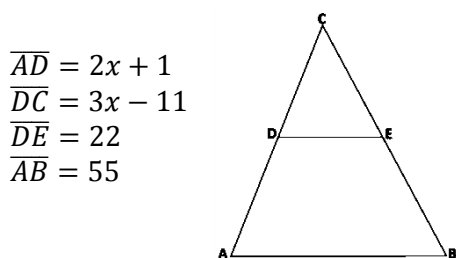
- a)  $75^\circ$                       b)  $45^\circ$                       c)  $65$                       d)  $55^\circ$

21. Consider next figure. The triangle BAC is an equilateral and segment AC is trisected. Demonstrate that triangles ABD and BCE are congruent and tell the congruence criteria.



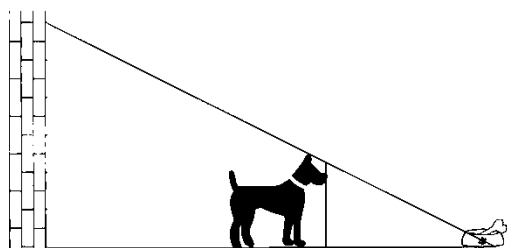
- a) *Criterial SSS*   b) *Criterial SAS*   c) *Criterial ASA*   d) *Criterial AAA*

22. In next figure,  $\overline{DE}$  and  $\overline{AB}$  are parallels. Considering the following data, determine the value of "x".



- a)  $x = 9$                       b)  $x = 12$                       c)  $x = 7$                       d)  $x = 6$

23. In a certain hour of the day, a wall, with 3.6 meters of height, gives a shadow to a dog that has 0.70 meters of height. If the dog is 1.2 meters from its food-bowl (see figure). Determine how far is the dog from the wall.



- a) 6.17m                      b) 4.97m                      c) 1.8m                      d) 5.14 m

**Consider that the interior angles of a regular polygon add up  $1620^\circ$  to answer exercises 24 to 26.**

24. Determine the number of its sides.

- a) 11                      b) 13                      c) 15                      d) 18

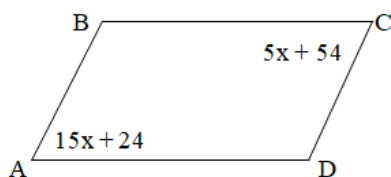
25. What is the measure of each interior and exterior angle?

- a)  $32.7^\circ$   
 $147.27^\circ$                       b)  $13.3^\circ$   
 $166.7^\circ$                       c)  $32.7^\circ$   
 $163.64^\circ$                       d)  $25.71^\circ$   
 $147.3^\circ$

26. Determine how many diagonals it has.

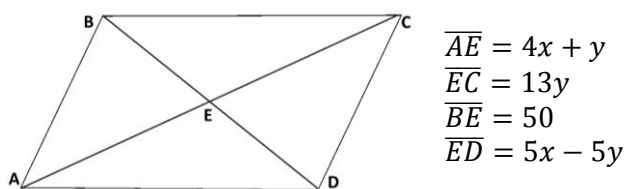
- a) 44                      b) 36                      c) 25                      d) 48

27. Find the value of angle D in the parallelogram of next figure.



- a)  $14.1^\circ$                       b)  $28.2^\circ$                       c)  $55^\circ$                       d)  $111^\circ$

28. Using the data of the next parallelogram, determine the value of "y".



- a)  $y = 5$                       b)  $y = 12$                       c)  $y = 15$                       d)  $y = 13$

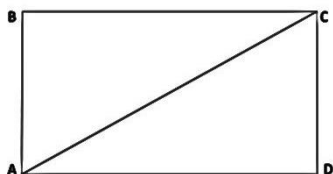
29. Calculate area "A" of a trapezoid if its bases are 15 and 9 cm respectively and its height is 6 cm.

- a)  $37.5cm^2$                       b)  $48cm^2$                       c)  $144cm^2$                       d)  $72cm^2$

30. Calculate the area of an equilateral triangle which perimeter is 48 cm.

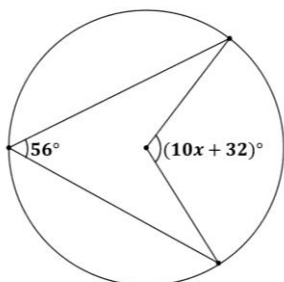
- a)  $64\sqrt{3} cm^2$                       b)  $8\sqrt{3}cm^2$                       c)  $100.7cm^2$                       d)  $128\sqrt{3} cm^2$

31. In the next rectangle, segment AC measures 39 cm and CD has 22 cm. Calculate its area.



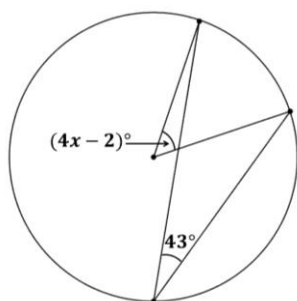
- a)  $108.4cm^2$                       b)  $354.2cm^2$                       c)  $540cm^2$                       d)  $708.4cm^2$

32. Taking into account the data of next figure, calculate the value of "x".



- a)  $x = 2.4$                       b)  $x = 8$                       c)  $x = 7$                       d)  $x = 6$

33. In the following figure, determine "x".

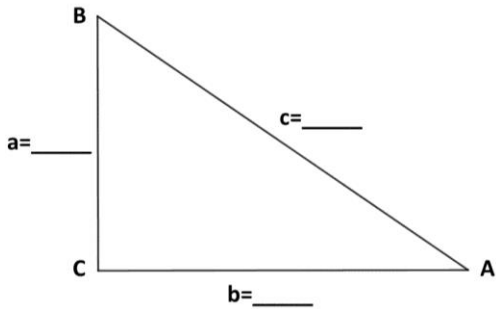


- a)  $x = 2$                       b)  $x = 5$                       c)  $x = 22$                       d)  $x = 24$

STAGE 3 AND 4.

INSTRUCTIONS: Solve each of the following problems of Trigonometry correctly.

34. In the next right triangle, the value of Sine of angle A is  $\frac{5}{7}$ . First, determine values for sides a, b, and c, then answer problems 35 and 36.



35. What is  $\tan A$  ?

- a)  $\frac{5\sqrt{6}}{12}$       b)  $\frac{\sqrt{24}}{3}$       c)  $\frac{5}{7}$       d)  $\frac{7}{5}$

36. Find the value of angle ?

- a)  $35.54^\circ$       b)  $44.42^\circ$       c)  $45.58^\circ$       d)  $0.012^\circ$

37. In a triangle, if  $\sin B = \cos 35^\circ$ , what is the measure of angle A?

- a)  $35^\circ$       b)  $40^\circ$       c)  $50^\circ$       d)  $55^\circ$

38. If  $\sec B = \sqrt{7}$ , obtain the value of  $\cos B$

- a)  $\frac{\sqrt{6}}{\sqrt{7}}$       b)  $\frac{\sqrt{6}}{1}$       c)  $\frac{\sqrt{7}}{7}$       d)  $\frac{7\sqrt{6}}{7}$

39. Evaluate next expression without using calculator:  $\cos^2 30^\circ + \sin^2 30^\circ - 5 \tan 45^\circ =$

- a) 2      b) 3      c) -4      d) -5

40. If  $\sec A = 1.1034$ , then  $\cos A =$

- a) 0.9998      b) 0.9063      c) 1.0002      d) 0.2946

41. Calculate the value of angle  $\theta$ , if  $\tan \theta = 1.8341$

- a)  $64.55^\circ$       b)  $61.4^\circ$       c)  $25.45^\circ$       d)  $59.9^\circ$

42. If  $\sec \theta = 1.7883$ , calculate the measure of angle  $\theta$

- a)  $38^\circ$       b)  $56^\circ$       c)  $19^\circ$       d)  $63^\circ$

43. What is the value of  $\sec 250^\circ$ ? Use the angle of reference concept.

- a)  $-2.9238$       b)  $2.9238$       c)  $-1.0642$       d)  $0.3640$

44. Calculate the value of  $\tan -216^\circ$

- a)  $0.7265$       b)  $-1.3764$       c)  $1.3764$       d)  $-0.7265$

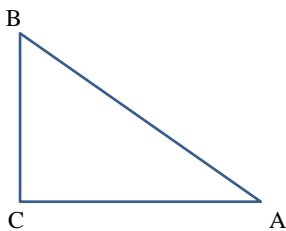
45. Evaluate next trigonometric expression:  $\sin 0^\circ - 3\sin 270^\circ + \sec 180^\circ - 4\cos 270^\circ =$

- a)  $-2$       b)  $1$       c)  $2$       d)  $-1$

46. Evaluate the trigonometric expression:  $7\cos \frac{\pi}{2} + 6\sin \frac{\pi}{2} + 3\sin \frac{3\pi}{2} + \cos \pi - \sin \frac{\pi}{2} =$

- a)  $2$       b)  $1$       c)  $0.5$       d)  $0$

47. Determine the value of the hypotenuse in the following right triangle if its base measures 35, and angle  $B = 36^\circ 52'$ .



- a)  $37.74$       b)  $46.67$       c)  $58.33$       d)  $16.96$

48. If  $\cos \theta = 0.32556$  find the value of  $\theta$ , if  $0^\circ \leq \theta \leq 360^\circ$

- a)  $71^\circ$  and  $289^\circ$       b)  $-71^\circ$  and  $-289^\circ$       c)  $71^\circ$  and  $-289^\circ$       d)  $-71^\circ$  and  $289^\circ$

49. Simplify:  $(\sec B - \cos B) \cos B =$

- a)  $\cos B$       b)  $\sin^2 B$       c)  $1 + \sin B$       d)  $1$

50. A tree of 6 meters height cast a shadow of 4 meters. Determine the elevation angle of the sun. Sketch the figure.

- a)  $0.8320^\circ$       b)  $41.81^\circ$       c)  $48.19^\circ$       d)  $56.31^\circ$

51. From the top side of a 60 meters height lighthouse, a person observes a ship in the sea with a depression angle of  $12^\circ$ . What is the distance from the ship to the lighthouse? Sketch the figure.

- a) 13.5 m                      b) 61.34 m                      c) 288.58 m                      d) 282.28 m

52. If a point  $P(-3, -4)$  is on the terminal side of an angle in normal position, determine  $\cos \theta$ . Sketch a figure.

- a)  $\frac{-13}{5}$                       b)  $-0.6$                       c)  $\frac{-5}{3}$                       d)  $\frac{2}{-5}$

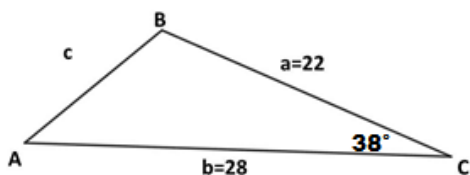
53. Calculate the angle of reference of an angle which measure is  $244^\circ$ .

- a)  $26^\circ$                       b)  $116^\circ$                       c)  $296^\circ$                       d)  $64^\circ$

54. Given the trigonometric function  $\cos \theta = -0.64279$  determine the value of  $\theta$ , knowing its radial distance is on the second quadrant.

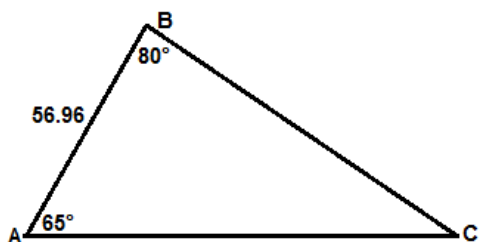
- a)  $-0.6428^\circ$                       b)  $0.6428^\circ$                       c)  $130^\circ$                       d)  $230^\circ$

55. Calculate the value of side c in the next oblique triangle.



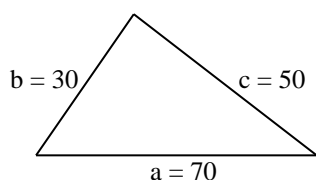
- a) 17.24                      b) 297.17                      c) 47.32                      d) 28.5

56. Determine the value of b in the triangle of next figure.



- a) 69.6                      b) 90                      c) 97.8                      d) 82.8

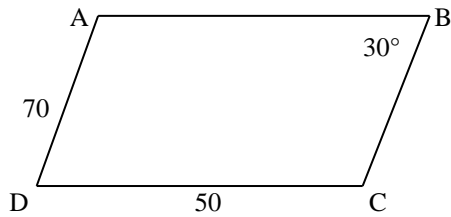
57. Calculate the area in the given triangle:



- a)  $116.67u^2$                       b)  $1750 u^2$                       c)  $525 u^2$                       d)  $649.47 u^2$

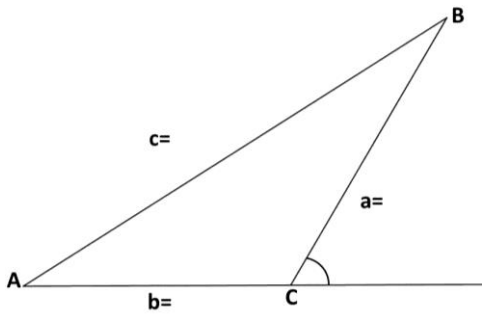


58. The next figure is a parallelogram ABCD. Using the available data, calculate its area.



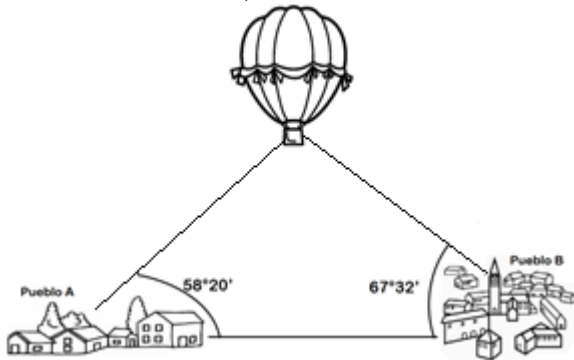
- a)  $875.51u^2$       b)  $1838.51u^2$       c)  $1750 u^2$       d)  $3521.51u^2$

59. An airplane flies 240 km from city A to city C; then it changes its direction 40° and flies towards city B. It is known that distance between cities B and C is 162 km. Write down these data in the next figure and obtain the distance from city A to city B.



- a) 420.1 km      b) 350.3 km      c) 378.7km      d) 572.5 km

60. Alejandro is at town A and observes a hot air balloon with an elevation angle of  $58^{\circ}20'$ . At the same time, Luisa is in town B and observes the same hot air balloon with an elevation angle of  $37^{\circ}32'$ . Determine how many kilometers are between town A and the hot air balloon, if it is known that towns are separated by 20km.



- a) 21 km      b) 35 km      c) 22.8 km      d) 38.5 km      e) 56.6 km