

Integrated Mathematics Summer School
Final Pre-Test

WEEK 1 MATERIAL:

Simplify each of the following (2 points each):

| | |
|---------------------------------|--------------------------------|
| 1. $\frac{18a^{15}b^7}{42ab^4}$ | 2. $\frac{8(3ac)^4}{9(3ab)^2}$ |
|---------------------------------|--------------------------------|

Name each of the polynomials by degree and number of terms (2 points each):

| | |
|--------------------------------|-------------------|
| 3. $x^4 - 3x^3 + 2x^2 - x + 8$ | 4. $x^5 + 3x - 2$ |
|--------------------------------|-------------------|

Simplify each of the following by performing the specified operation (2 points each):

| | |
|-----------------------------------------|--------------------------------------------|
| 5. $(7x + 3x^2 - 6) + (3x^2 - 8x + 10)$ | 6. $(7x + 3x^2 - 6) - (3x^2 - 8x + 10)$ |
| 7. $(-2x + 3)(-x + 4)$ | 8. $(2x^3 + 5x^2 - 32x - 35) \div (x + 1)$ |

Completely factor each of the following (2 points each):

| | |
|----------------------|------------------------------|
| 9. $16x^8 - 4x^5$ | 10. $25x^2 - 144$ |
| 11. $x^2 + 6x + 5$ | 12. $2x^2 + 3x - 35$ |
| 13. $x^3 - 216$ | 14. $8x^3 + 125$ |
| 15. $x^4 - 8x^2 + 7$ | 16. $2x^3 + 5x^2 - 32x - 35$ |

Find the slope of the line containing the given points (2 points each):

| | |
|---------------------------|----------------------------|
| 17. $(7, -2)$ & $(-3, 4)$ | 18. $(-9, 4)$ & $(-11, 2)$ |
|---------------------------|----------------------------|

Write the Linear Equation in Slope-Intercept form using the given information (2 points):

| | |
|----------------------------|---------------------------|
| 19. $(-2, 13)$ & $(4, 17)$ | 20. $(0, -7)$ & $(8, -3)$ |
|----------------------------|---------------------------|

WEEK 2 MATERIAL:

Solve each of the following Linear Equations (2 points each):

| | |
|----------------------------------|--------------------------|
| 21. $3x + 12 - 2x = 7x + 2 - 10$ | 22. $2(7x + 1) - 5 = 25$ |
|----------------------------------|--------------------------|

Solve the following Quadratic Equations (2 points each):

| |
|---------------------|
| 23. $6x^2 - 7x - 5$ |
|---------------------|

Solve the given Polynomial (4 points):

24. $2x^3 + 5x^2 - 32x - 35$

Solve the following Exponential Equations (2 points each):

25. $3^{5x+8} = 81^{-2x+3}$

Solve the following Logarithmic Equations (2 points each):

26. $\log_2(x + 3) - \log_2(3x + 1) = 6$

Identify the midpoint of each of the following (2 points each):

27. $(-10, 15)$ & $(20, 7)$

28. $(8, -7)$ & $(-4, 11)$

Find the distance between the given points:

29. $(-10, 15)$ & $(20, 7)$

30. $(8, -7)$ & $(-4, 11)$

Identify each of the following using the diagram to the right:

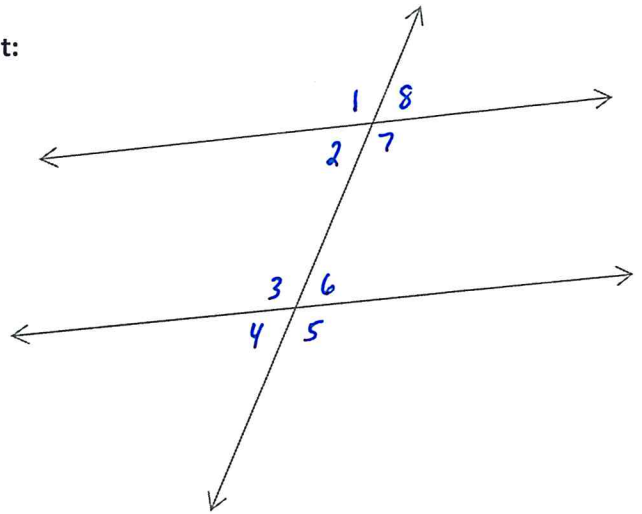
31. List all the pairs of Corresponding Angles.

32. List all the pairs of Alternate Interior Angles.

33. List all the pairs of Alternate Exterior Angles.

34. List the Same-Side Interior Angles.

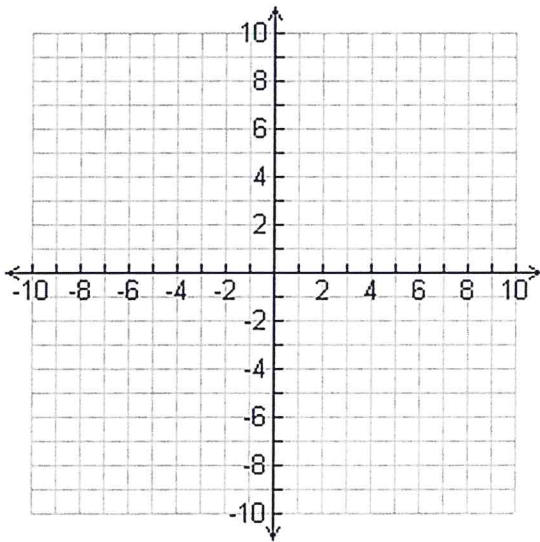
35. List all of the Vertical Angles.



Graph each of the following functions:

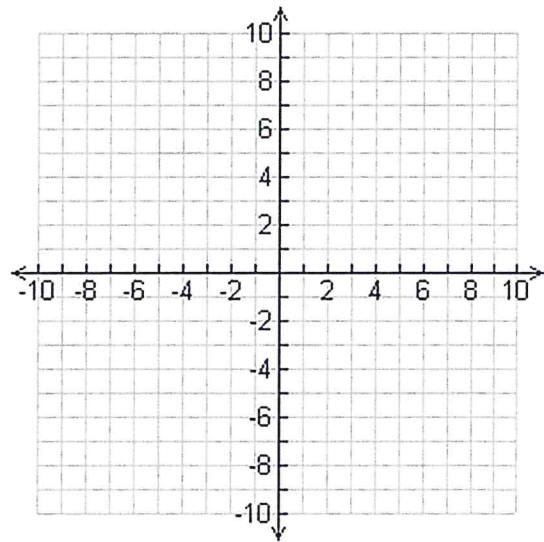
36. LINEAR

$$y = -3x - 7$$



37. QUADRATIC

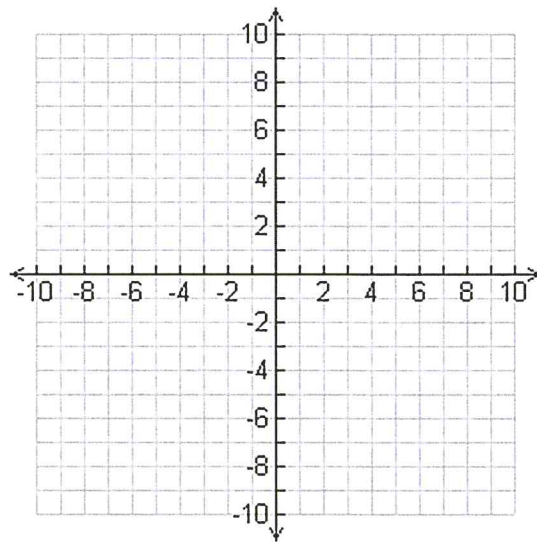
$$y = -2x^2 - 6x + 3$$



Graph each of the following functions:

38. RATIONAL FUNCTION

$$f(x) = \frac{x^2 + 8x + 12}{x^2 - 5x - 14}$$



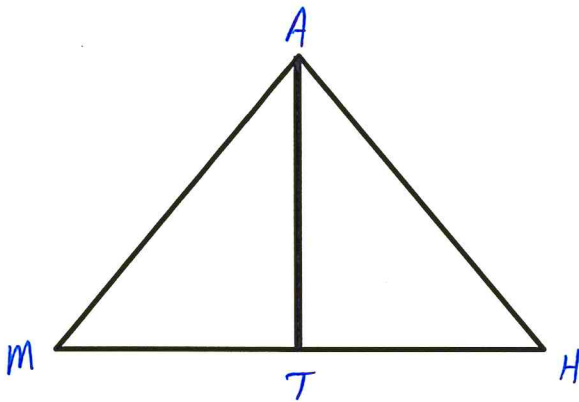
WEEK 3 MATERIAL:

Prove the following triangles are CONGRUENT using SSS, SAS, ASA, AAS or HL:

39. **Given:** $\triangle MAH$ is an equilateral \triangle

T is the midpoint of \overline{MH}

Prove: $\triangle MTA \cong \triangle HTA$



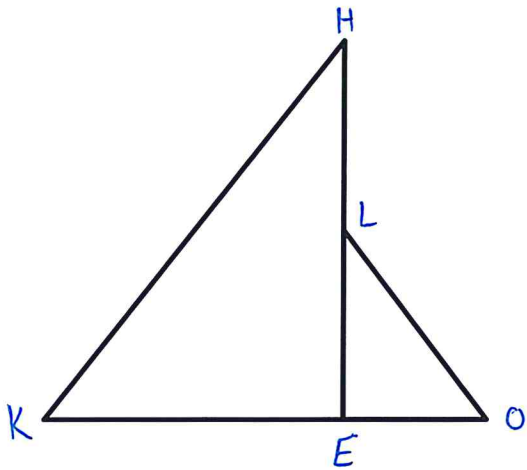
Prove the following triangles are SIMILAR using SSS, SAS, or AA:

40. Given: $\overline{HE} \perp \overline{KO}$

$$KE = 24, EO = 8, LO = 17$$

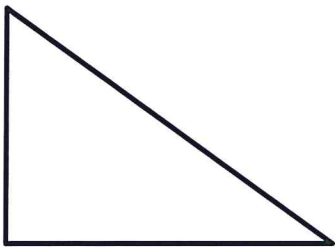
$$HL = 30, LE = 15, KH = 51$$

Prove: $\triangle KHE \sim \triangle OLE$

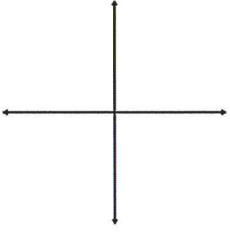
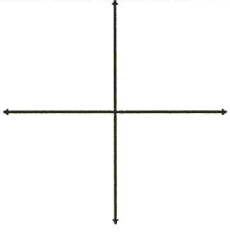
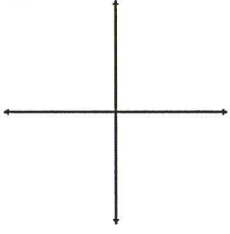


Evaluate the six trigonometric functions for the regular right triangle using $\angle A$:

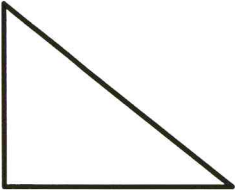
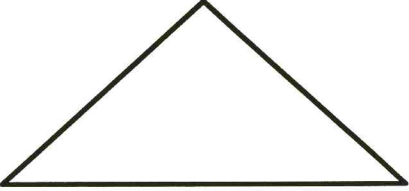
41. $a = 33$, $b = 56$, & $c = 65$



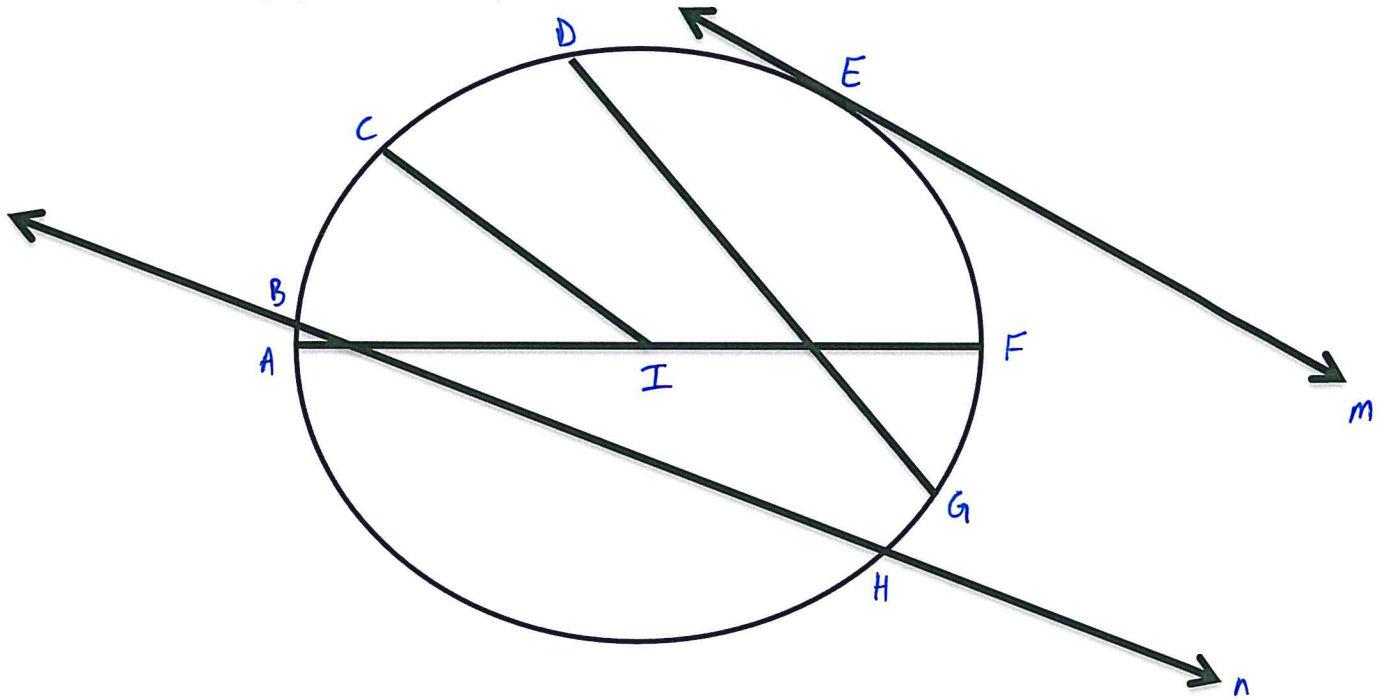
Using the hand trick discussed in class, give the exact value of each of the following trig functions:

| Given Angle | Reference Angle | Quadrant Terminal Side is located in | Exact Value |
|-----------------------|------------------------------------------------------------------------------------|--------------------------------------|-------------|
| 42. $\sin -135^\circ$ |  | | |
| 43. $\cos 390^\circ$ |  | | |
| 44. $\tan 300^\circ$ |  | | |

Solve the following triangles given the information provided on a separate sheet of paper:

| | |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <p>45. $\angle A = 30^\circ$ & $c = 20$</p>  | <p>46. $a = 17$, $b = 20$, & $\angle C = 48^\circ$</p>  |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|

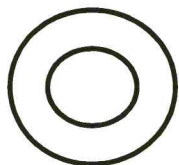
Use the following figure to answer questions #47 - #53:



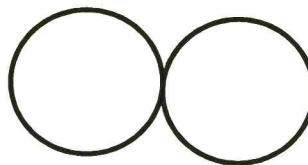
| | |
|-------------------------------------------|----------------------------------------------------|
| <p>47. Name any chords shown above.</p> | <p>48. Name the secant shown above.</p> |
| <p>49. Name the diameter shown above.</p> | <p>50. Name all radii shown above.</p> |
| <p>51. Name the tangent shown above.</p> | <p>52. Name the point of tangency shown above.</p> |
| <p>53. Name the circle shown above.</p> | |

Identify the number of and draw each common tangent in each of the following figures:

54.



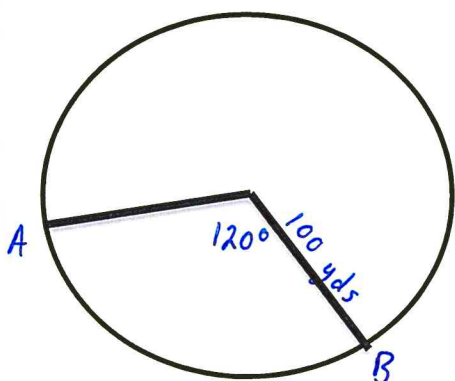
55.



Find the indicated measure:

56. Find the circumference of a circle with a diameter of 100 yards.

57. Find the length of \widehat{AB} given



Find the indicated measure:

58. Find the area of a circle with a diameter of 100 yards.

59. Find the area of the sector given:

