Homework: pg 392 # 1, 3ace, 5, 7

**Equivalent Trigonometric Functions**

Some basic trigonometric identities can be created using three techniques:

1. Graph analysis
2. Trigonometric comparisons in a right triangle.
3. The CAST rule with related angles.

**Graph Analysis**

Create sketches of each primary trigonometric functions; 

 y = sinθ y = cosθ y = tanθ

* How can sinθ be expressed as a transformation of cosθ?
* How can cosθ be expressed as a transformation of sinθ?
* The function y = cosθ is an even function. How can cosθ be expressed as a transformation of itself?
* The function y = sinθ and y = tanθ are odd functions. How can this be shown with transformations?

**Using a Right Triangle (Cofunctions)**

θ

side 1

side 3

side 2

Label the angle in the lower right corner of the triangle above.

Determine two trigometric expressions that are equivalent to each ratio.

|  |  |
| --- | --- |
| Ratio | Equivalent Trigonometric Expressions |
|  |  |
|  |  |
|  |  |

**The CAST Rule with Related Angles**

y

x

C

T

arm 3

S

A

arm 4

arm 2

arm 1

θ

In the above diagram the related angle of arm 1, arm 2, arm 3 and arm 4 are all equivalent. Determine the sine, cosine, and tangent for the terminal arm 2, arm 3, arm 4 in terms of the primary trigonometric values of arm 1.

|  |  |  |  |
| --- | --- | --- | --- |
|  | Arm 2 | Arm 3 | Arm 4 |
| Sine |  |  |  |
| Cosine |  |  |  |
| Tangent |  |  |  |