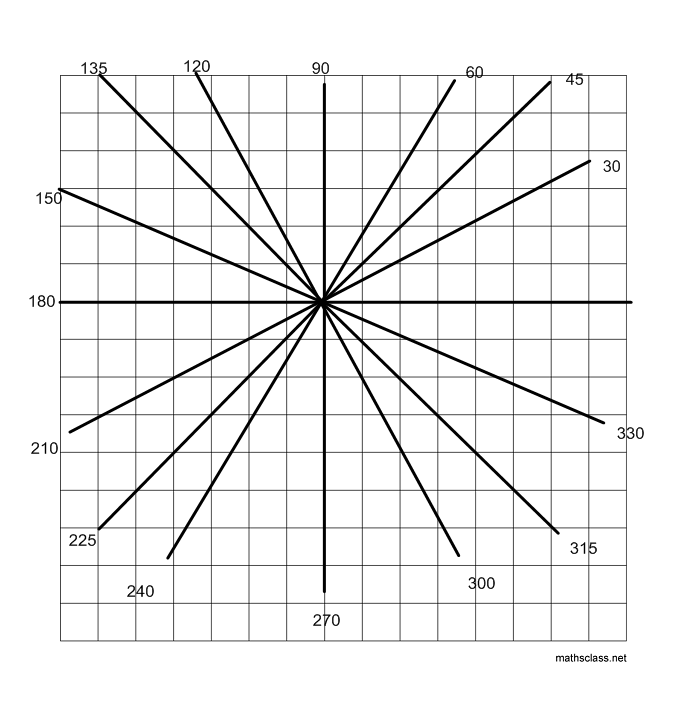
**6.2 – Radians and Special Angles**: Independent Study

Read 6.2 in your textbook, complete this handout, and complete the homework questions by Wednesday.

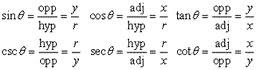
**Express all the important angles below in radians and complete the table at the bottom of the page.**

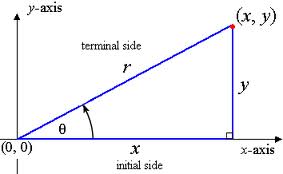
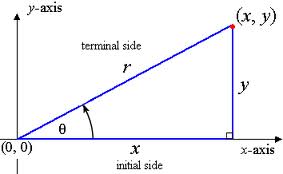
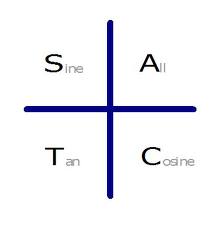


|  |  |
| --- | --- |
|  |  |
|  |  |



|  |  |  |
| --- | --- | --- |
|  | Special Angles | |
| Degrees | specialtriangle | specialtriangle2 |
| Radians | Draw the diagrams with the angles in radians | Draw the diagrams with the angles in radians |

**RECALL:** 

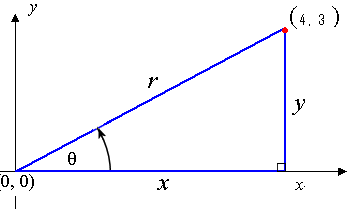
 

r2 = x2 + y2

**Complete the trigonometric ratio table for the 3 special angles.**

|  |  |  |  |
| --- | --- | --- | --- |
|  | /4 | /6 | /3 |
| Sin() |  |  |  |
| Cos( ) |  |  |  |
| Tan() |  |  |  |
| Csc() |  |  |  |
| Sec() |  |  |  |
| Cot() |  |  |  |

**Example 1:** Find the angle in radians of the angle whose terminal arm ends at (4,3).



Since you have x and y, use tan = y/x

tan = ¾

MAKE SURE YOUR CALCULATOR IS IN RADIANS

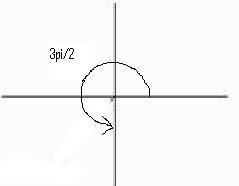
= tan-1 ¾

= .6435 radians

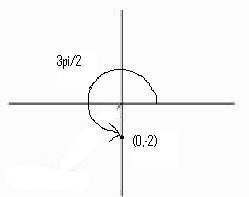
**You try:** Find the angle in radians of the angle whose terminal arm ends at (3,7) (Ans: 1.17)

**Example 2**: Determine sin (3 /2).

Sketch where 3 /2 is on the Cartesian plane.



Pick ANY point on the terminal arm. E.g (0, -2) is on the terminal arm.



Recall sin (3 /2) = y/r , so you must find **r** using r2 = x2 + y2

r2 = 02 + (-2)2

= 0 + 4

= 4

r = 4 ½

= 2

Use the formula sin (3 /2) = y/r

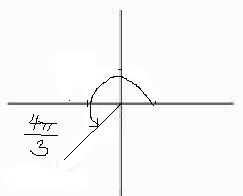
sin (3 /2) = -2/2 = -1 (you can now check with your calculator that sin (3/2) = -1)

**You try**: Determine the exact value of cot ( /2)

(The answer should be 0)

**Example 3:** Determine the exact value of sin 4 /3.

Sketch the angle in standard position.



Related Acute Angle

In Q2 θr= π – θ

In Q3 θr = θ – π

In Q4 θr= 2 π – θ

=

Determine the related acute angle since we are not in quadrant 1.

Related Acute Angle = 4 /3 –

= /3

Change the question to involve the related acute angle sin /3

Sin /3 = √3 / 2 (USE THE CHART ABOVE)

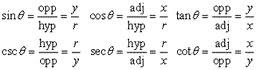
Use CAST rule to determine if the answer should be positive or negative.

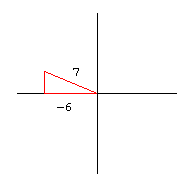
Sin 4 /3 = - √3 / 2 since in Q3, sine is negative.

**You TRY:** Determine the exact value of cos (5 /4) and csc(11 /6)  **(CHECK SOLUTIONS ON PAGE 326)**

**Example 4:** If cos = - 6 /7, where [0,2], evaluate to the nearest hundredth.

Draw the two possible locations of , remembering that cos is negative in 2 quadrants according to CAST. I have drawn one possibility. Can you draw the other?





Ignore all negatives and imagine that the drawing was in Q1 where x and y would both be positive and find the related acute angle.

Calculate cos r = 6/7

r = 0.54

Above you found the related acute angle, find the actual angles in Q2 and Q3.

In Q2: = π – θr

= 3.14 – 0.54 = 2.60

Related Acute Angle

In Q2 θ= π – θr

In Q3 θ = π + θr

In Q4 θ= 2 π – θr

=

In Q3: = π + θr

= 3.14 + 0.54 = 3.68

**You try:** Solve for if tan = - 7/24

(Check your answers on page 328)

**HOMEWORK: pg 330 #5-10 ; 13-16**

