1. Determine the exact value of each of the following trigonometric ratios. (Hint: Use a sketch to determine in which quadrant the terminal arm of the principal angle lies, the value of the related acute angle, and the sign of the ratio)

1

1







1

2



S

T

A

C

a) cos  = -cos 

= 

b) sin  = -sin 

= 

= 

= 

c) tan  = tan 

= 

d) sec  = 

= 

=  (i.e. reciprocal of )

= 

= -2

e) csc  = 

= 

= 

=  (i.e. reciprocal of )

= 

= 

2. For each of the following, determine the values of  in radians if . (Hint: Use a sketch to determine in which quadrant the angles lie)

cos is +ve in 1st and 4th quadrants





or

a) 

Acute angle 

tan is -ve in 2nd and 4th quadrants





or

b) 

Acute angle 

c) 

cos is -ve in 2nd and 3rd quadrants





or



Acute angle 

3. Determine the exact value of each of the following trigonometric ratios. Check your answers using the unit circle.

a) cos  = 

b) sin  = 

c) csc  = 

= 

d) sec  = 

= 

= 1

4. tan  is undefined. Use the unit circle to explain why.

