

**SECTION 3.5 COSECANT SECANT AND COTANGENT FUNCTIONS**

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1) REVIEW: RECIPROCAL FUNCTIONS  $y = \frac{1}{f(x)}$

- The reciprocal function takes the
- When graphing a reciprocal function, there are a three main steps:

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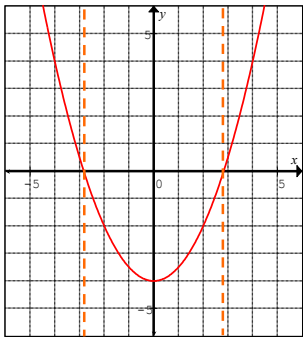
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PRACTICE: GIVEN THE FOLLOWING FUNCTION, GRAPH THE RECIPROCAL



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II) RECIPROCAL OF TRIGONOMETRIC FUNCTIONS

- Cosecant is the reciprocal of the sine function

$$\csc \theta =$$

$$\csc \theta =$$

- Secant is the reciprocal of the cosine function

$$\sec \theta =$$

$$\sec \theta =$$

- Cotangent is the reciprocal of the tangent function

$$\cot \theta =$$

$$\cot \theta =$$

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Ex: Determine the value of each expression to 3 decimal places

i)  $\csc 225^\circ$

ii)  $\sec 135^\circ$

iii)  $\cot 2.27$   
(radian mode)

iv)  $\csc(-3.66)$   
(radian mode)

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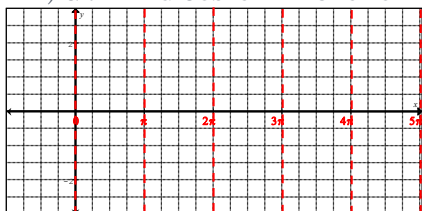
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III) GRAPHING COSECANT FUNCTION



- When  $\sin \theta = 0$ , you will get
- When  $\sin \theta = 1$  or  $-1$ , you will get
- Take the reciprocal of each sub-domain
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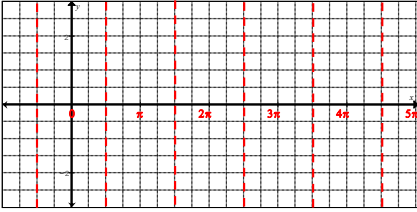
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IV) GRAPHING SECANT FUNCTION



- When  $\cos\theta=0$ , you will get
- When  $\cos\theta=1$  or  $-1$ , you will get
- Take the reciprocal of each sub-domain
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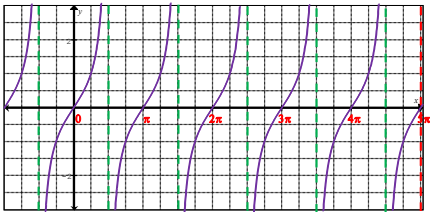
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V) GRAPHING COTANGENT FUNCTION



- V.A. from  $\tan\theta$  will become
- When  $\tan\theta=0$ , you will get
- When  $\tan\theta=1$  or  $-1$ , you will get
  - Y-coordinates are large  $\rightarrow$
  - Y-coordinates are small  $\rightarrow$

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EX: INDICATE THE DOMAIN & RANGE FOR EACH OF THE FOLLOWING FUNCTIONS:

i)  $y = \csc\theta$

Domain: \_\_\_\_\_

Range: \_\_\_\_\_

ii)  $y = \sec\theta$

Domain: \_\_\_\_\_

Range: \_\_\_\_\_

iii)  $y = \cot\theta$

Domain: \_\_\_\_\_

Range: \_\_\_\_\_




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EX: SOLVE FOR  $\theta$  IN EACH OF THE FOLLOWING:

$$\csc \theta = \frac{2}{\sqrt{3}}$$

$$\cot \theta = \frac{-5}{\sqrt{7}}$$

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