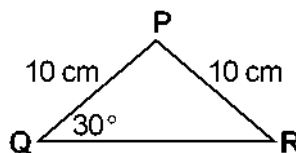


## Math 433/ Review for Fourth Quarter Exam (Optional)

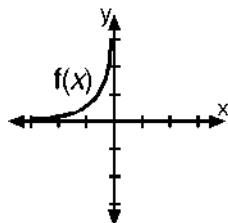
Name: \_\_\_\_\_

- 1)  $\log (\cot \theta)$  is equivalent to  
 A)  $\log (\sin \theta) + \log (\cos \theta)$  C)  $\log (\cos \theta) - \log (\sin \theta)$   
 B)  $\log (\cos \theta) + \log (\sin \theta)$  D)  $\log (\sin \theta) - \log (\cos \theta)$
- 2) The expression  $\sec^2 \theta + \csc^2 \theta$  is equivalent to  
 A)  $1 + \tan^2 \theta$  B)  $\frac{1}{\sin^2 \theta \cos^2 \theta}$  C)  $\sin^2 \theta \cos^2 \theta$  D)  $1 - \tan^2 \theta$
- 3) The expression  $\frac{1 + \cos 2x}{\sin 2x}$  is equivalent to  
 A)  $\cot x$  B)  $-\cos x$  C)  $\tan x$  D)  $-\sin x$
- 4) The expression  $(\cos \alpha)(\csc \alpha - \sec \alpha)$  is equivalent to  
 A)  $-\cos \alpha$  B)  $1 - \tan \alpha$  C)  $\tan \alpha - 1$  D)  $\cot \alpha - 1$
- 5) What is the length of  $\overline{QR}$  in centimeters?

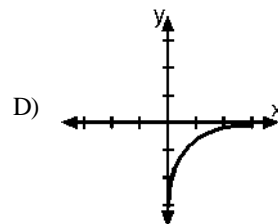
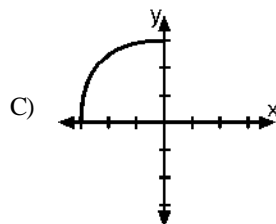
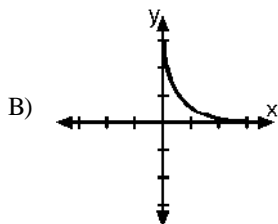
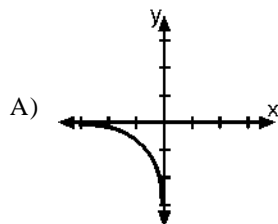


- A)  $10\sqrt{3}$  B) 5 C) 10 D)  $5\sqrt{3}$
- 6) Which relation is also a function?  
 A)  $x^2 + y^2 = 36$  B)  $x^2 - y^2 = 36$  C)  $y = 4x^2$  D)  $9x^2 + 4y^2 = 36$
- 7) What restriction can be made to the domain of  $f(x) = 1 + x^2$  so that  $f^{-1}(x)$  will be a function?  
 A)  $x \leq 1$  B)  $x \geq -2$  C)  $-1 \leq x \leq 1$  D)  $x \geq 0$
- 8) If  $\sin A = \frac{3}{5}$ ,  $\sin B = \frac{2}{3}$ , and  $\angle A$  and  $\angle B$  are acute angles, what is the value of  $\cos (A - B)$ ?  
 A)  $-\frac{2}{3}$  B)  $\frac{4\sqrt{5}+6}{15}$  C)  $\frac{4\sqrt{5}+2}{5}$  D)  $\frac{4\sqrt{5}-6}{15}$

- 9) The accompanying diagram represents the graph of  $f(x)$ .



Which graph below represents  $f^{-1}(x)$ ?



- 10) Which of the following have the property that  $f(x) = f^{-1}(x)$ ?

I.  $y = -x$

II.  $y = -\frac{1}{x}$

III.  $y = -x^2$

IV.  $y = -x^3$

A) II and III, only

B) I, II, and III, only

C) II, III, and IV, only

D) I and II, only

- 11) The expression  $\cos 70^\circ \cos 10^\circ + \sin 70^\circ \sin 10^\circ$  is equivalent to

A)  $\cos 80^\circ$

B)  $\sin 80^\circ$

C)  $\cos 60^\circ$

D)  $\sin 60^\circ$

- 12) How many solutions exist for the equation  $3 \cos 2x = -3$  in the interval  $0 \leq x < 2\pi$ ?

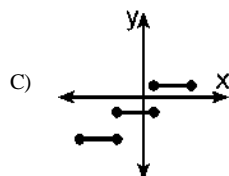
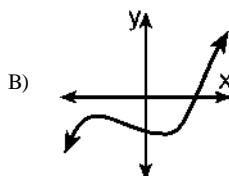
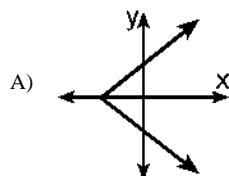
A) 1

B) 2

C) 3

D) 4

- 13) Which graph of a relation is also a function?



D) all of the above

- 14) If  $\sec x = \frac{\sqrt{5}}{2}$  with angle  $x$  in quadrant IV and  $\tan y = -\frac{1}{3}$  with angle  $y$  in quadrant II, find the value of  $\cos(x - y)$ .

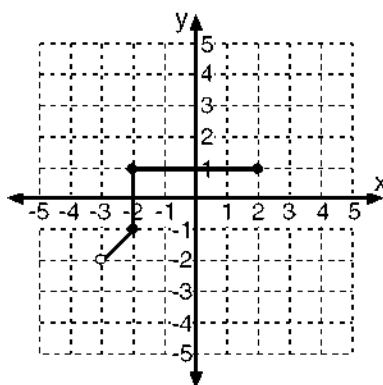
- 15) Find, to the nearest degree, the solution set of  $3 \sin^2 x = 5 \cos x + 1$  over the domain  $0^\circ \leq x < 360^\circ$ .

16) If  $\cos \theta = -\frac{3}{5}$ , find  $\cos 2\theta$  and express in simplest form.

17) If  $B$  is a second quadrant angle and  $\cos B = -\frac{15}{17}$ , find  $\sin 2B$ .

18) For the graph of the relation below,

- (a) state the domain.
- (b) state the range.
- (c) state whether or not the relation is a function. [*Justify your answer.*]



19) If  $g(x) = x + 3$  and  $f(x) = x^2 - 2$ , find the value of  $f(g(x - 3))$ .

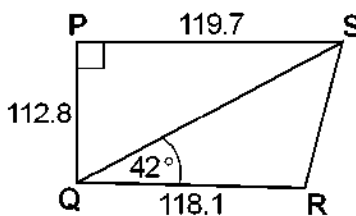
20) If  $A$  is a positive acute angle and  $\tan A = \frac{5}{6}$ , find the value of  $\cos 2A$ .

21) If  $x$  is a positive acute angle, solve  $4 \cos x - 2 = \cos x$  to the nearest degree.

22) How many different triangles can be constructed, given the parts  $m\angle A = 54^\circ$ ,  $a = 30$ , and  $b = 35$ .

23) Find, to the nearest degree, *all* values of  $x$  between  $0^\circ$  and  $360^\circ$  that satisfy the equation  $2 \sin x + 4 \cos 2x = 3$ .

- 24) Find, to the nearest degree, the solution set of  $2 \sec^2 B = 5 - \tan B$  over the domain  $0^\circ \leq x < 360^\circ$ .
- 25) Find the exact value of  $\cos 105^\circ$ .
- 26) Given  $2 \sin^2 x - \sin x = 0$ , solve for  $x$  in the interval  $0^\circ \leq x < 360^\circ$ .
- 27) If  $\sin A = \frac{12}{13}$  with angle  $A$  in quadrant  $II$  and  $\cos B = -\frac{4}{5}$  with angle  $B$  in quadrant  $III$ , find the value of  $\sin (A + B)$ .
- 28) Find, to the nearest degree, the solution set of  $\tan^2 x + 3 \tan x = 18$  over the domain  $0^\circ \leq x < 360^\circ$ .
- 29) Express  $\sec \theta + \sec \theta \tan^2 \theta$  as a single trigonometric function.
- 30) Find the exact value of  $1 - 2 \sin^2 157.5^\circ$ .
- 31) A developer wants to save space in his housing track for a park. The area he has in mind for the park is shown as quadrilateral PQRS in the diagram below. Find the area of the park to the nearest tenth of a square foot.



- 32) Two forces of 17 pounds and 39 pounds act on a body at an angle of  $142^\circ$ . Find, to the nearest pound, the resultant of these two forces.