

MATH 1112
FINAL EXAM REVIEW

I. State the equation of the unit circle.

- a. $x^2 - y^2 = 1$ b. $x + y = 1$ c. $x^2 + y^2 = 1$
d. $y^2 - x^2 = 1$ e. None of these.

II. If $\tan x = -\frac{12}{5}$, find $\sin x$ for x in Quadrant IV.

- a. 5 b. $-\frac{5}{13}$ c. $\frac{5}{13}$
d. $-\frac{12}{13}$ e. None of these.

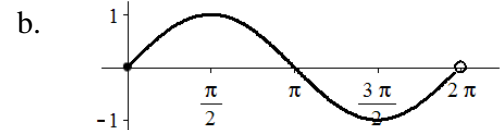
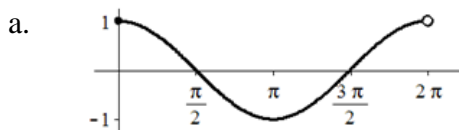
III. Give the exact value of each expression.

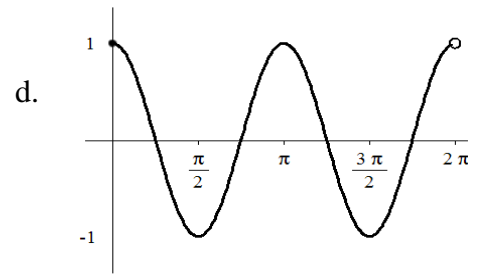
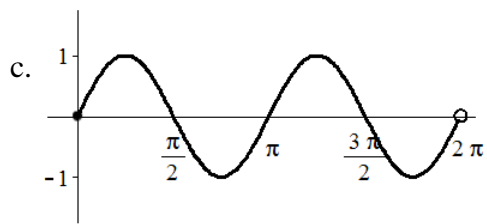
1. $\sin\left(-\frac{3\pi}{2}\right)$
a. -1 b. 0 c. Undefined
d. 1 e. None of these.
2. $\cos \pi$
a. -1 b. 0 c. Undefined
d. 1 e. None of these.
3. $\sin 150^\circ$
a. $\frac{\sqrt{3}}{2}$ b. $-\frac{\sqrt{3}}{2}$ c. $\frac{1}{2}$
d. $-\frac{1}{2}$ e. None of these.
4. $\cos 660^\circ$
a. $\frac{\sqrt{3}}{2}$ b. $-\frac{\sqrt{3}}{2}$ c. $\frac{1}{2}$
d. $-\frac{1}{2}$ e. None of these.

5. $\cos\left(-\frac{3\pi}{4}\right)$
- a. $-\frac{\sqrt{2}}{2}$ b. $\frac{\sqrt{2}}{2}$ c. $-\frac{\sqrt{3}}{2}$
- d. -1 e. None of these.
6. $\cos 0$
- a. 1 b. 0 c. -1
- d. Undefined e. None of these.
7. $\tan 315^\circ$
- a. $\frac{\sqrt{2}}{2}$ b. -1 c. 1
- d. $-\frac{\sqrt{2}}{2}$ e. None of these.
8. $\cot \pi$
- a. -1 b. 1 c. 0
- d. Undefined e. None of these.
9. $\sec\left(-\frac{5\pi}{6}\right)$
- a. -2 b. 2 c. $\frac{2\sqrt{3}}{3}$
- d. $-\frac{2\sqrt{3}}{3}$ e. None of these.
10. $\csc 0$
- a. Undefined b. 0 c. 1
- d. 2 e. None of these.

IV. Which of the following is a sketch of the graph of the given function on $[0, 2\pi)$?

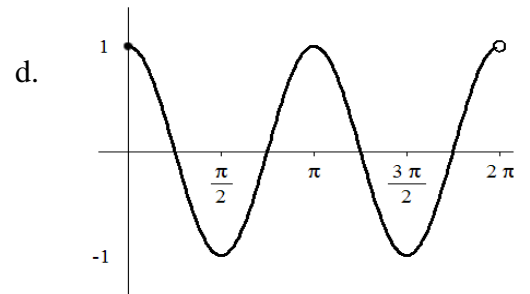
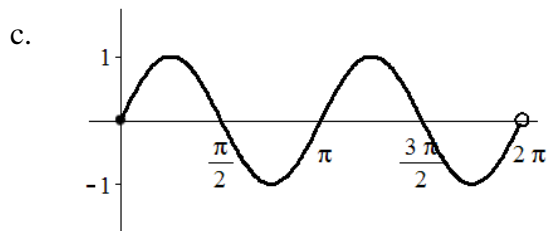
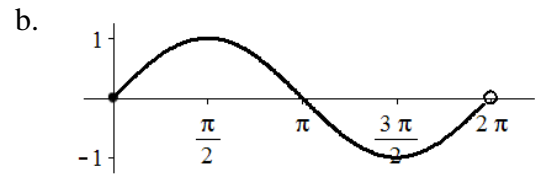
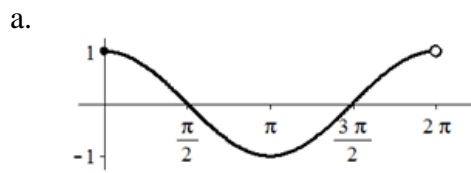
1. $y = \sin x$





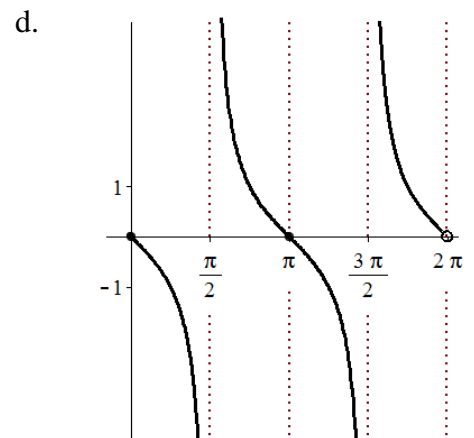
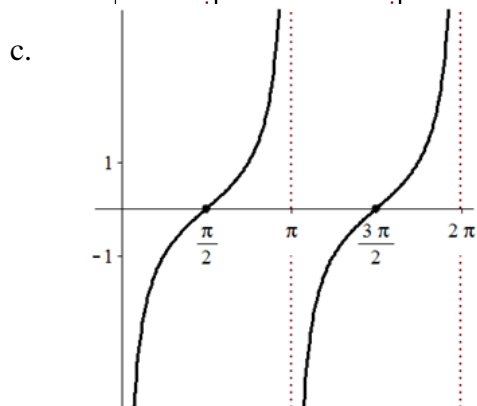
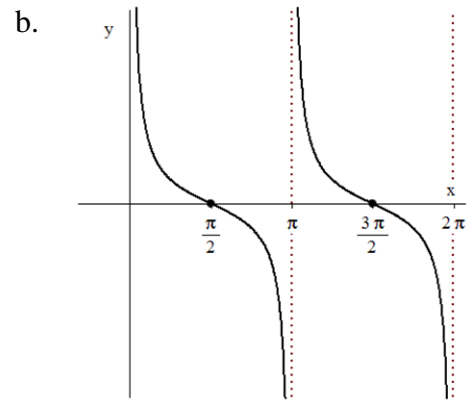
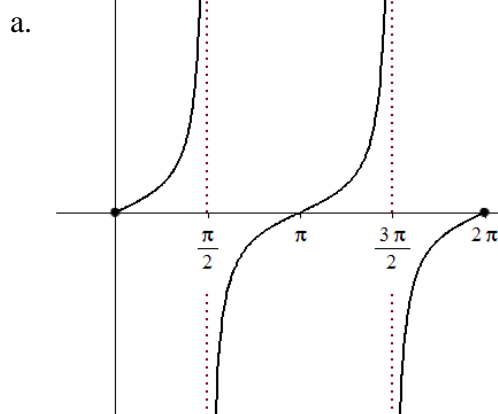
e. None of these.

2. $y = \cos x$



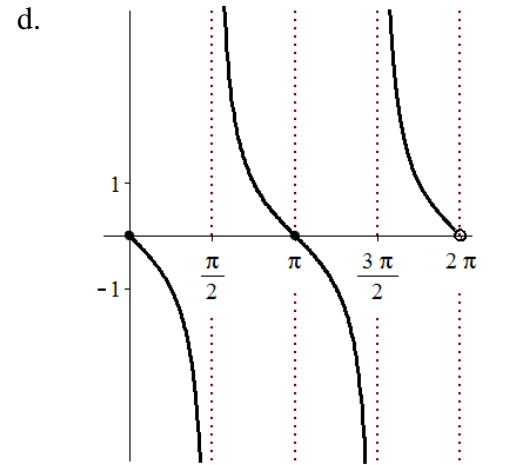
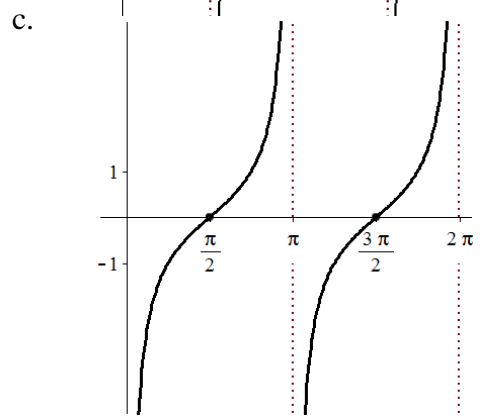
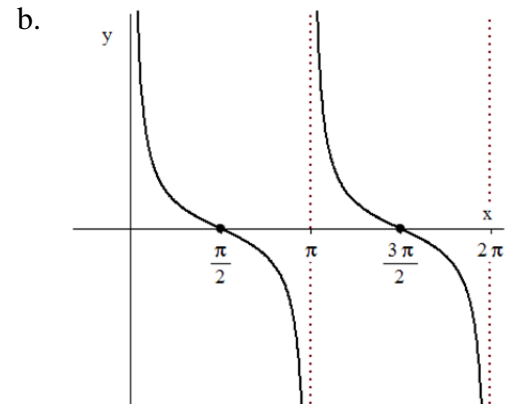
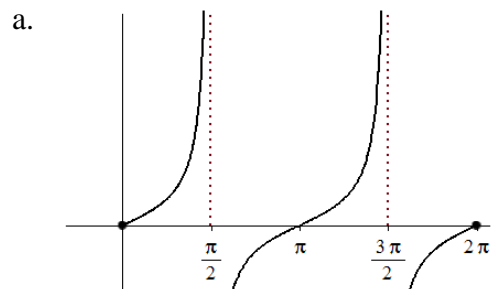
e. None of these.

3. $y = \tan x$



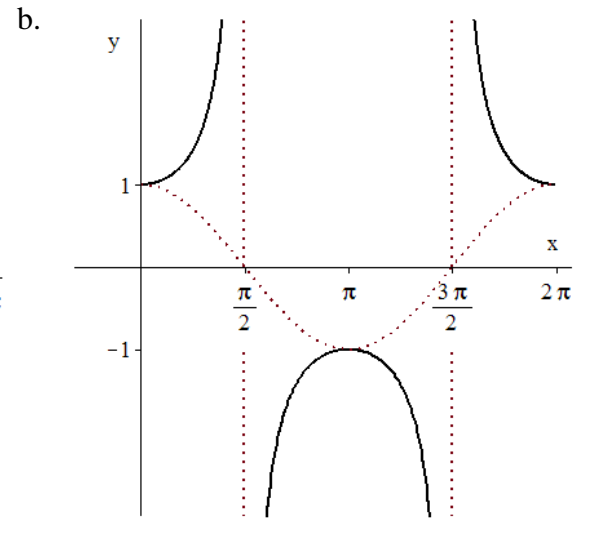
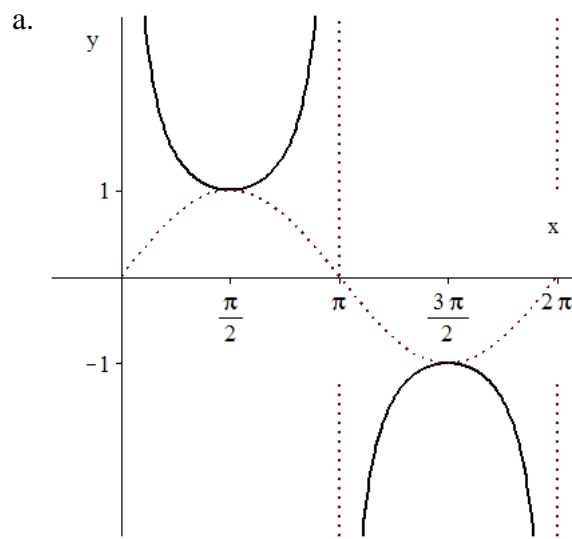
e. None of these.

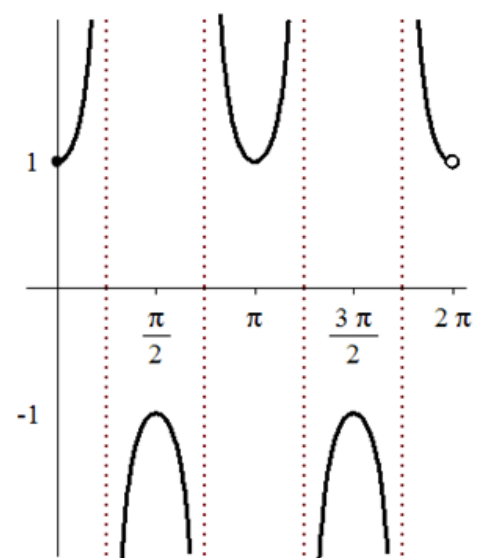
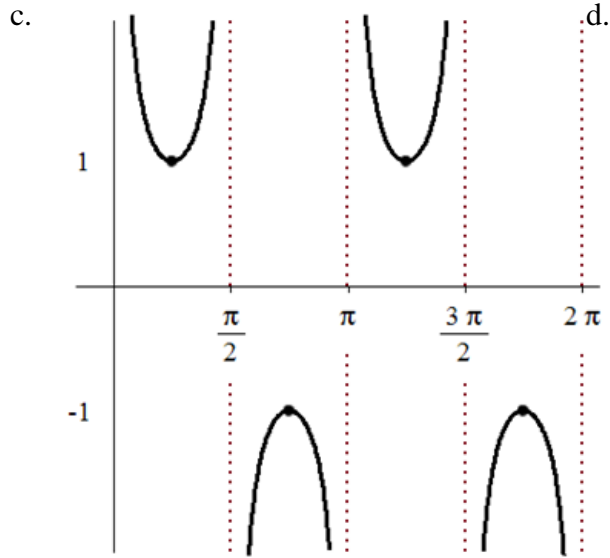
4. $y = \cot x$



e. None of these.

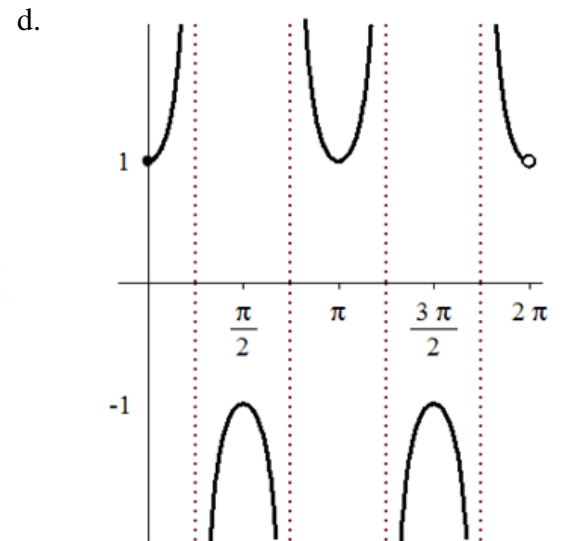
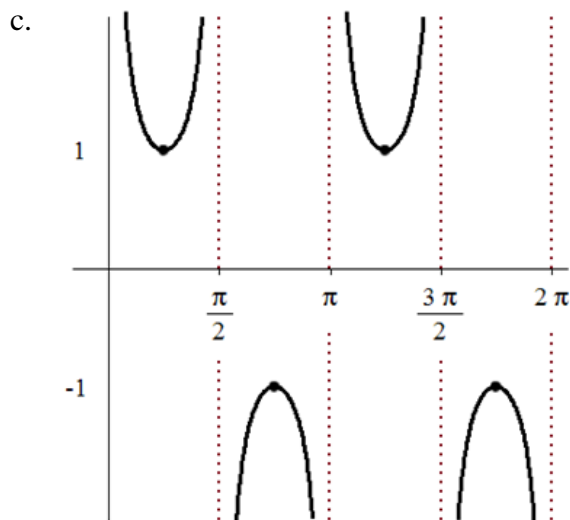
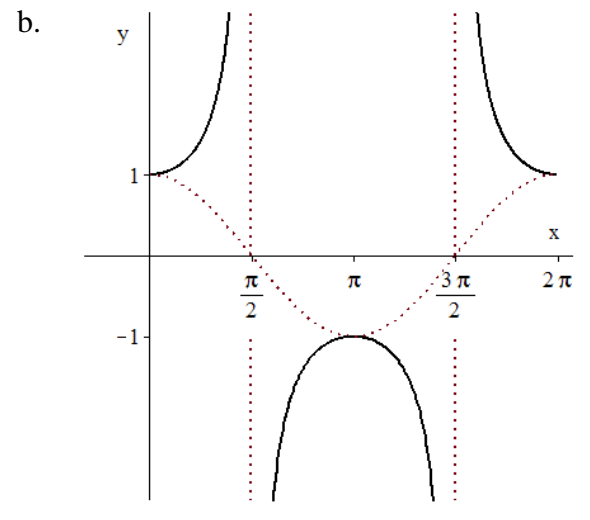
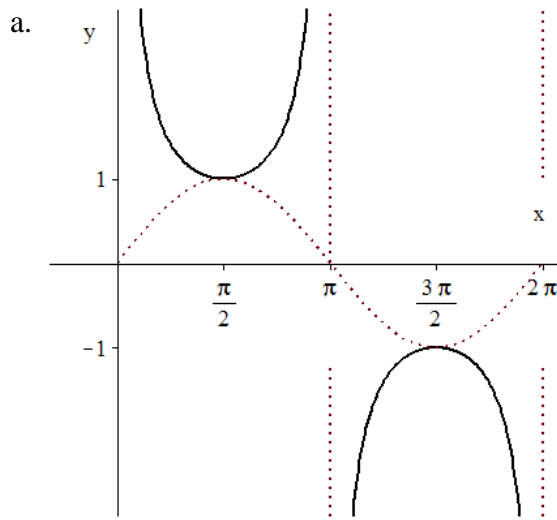
5. $y = \sec x$





e. None of these.

6. $y = \csc x$



e. None of these.

V. Simplify each expression.

1. $\cos(-\theta)$

a. $-\cos \theta$

b. $\cos \theta$

c. $\sin \theta$

d. $-\sin \theta$

e. None of these.

2. $\sin(-\theta)$

a. $-\cos \theta$

b. $\cos \theta$

c. $\sin \theta$

d. $-\sin \theta$

e. None of these.

3. $\tan(-\theta)$

a. $-\tan \theta$

b. $\tan \theta$

c. $\cot \theta$

d. $-\cot \theta$

e. None of these.

4. $\sec(-\theta)$

a. $-\sec \theta$

b. $\sec \theta$

c. $-\csc \theta$

d. $\csc \theta$

e. None of these.

VI. Evaluate each expression.

1. $\arccos\left(-\frac{\sqrt{2}}{2}\right)$

a. $\frac{7\pi}{4}$

b. $\frac{\pi}{4}$

c. $-\frac{\pi}{4}$

d. $\frac{3\pi}{4}$

e. None of these.

2. $\sin^{-1}\left(-\frac{\sqrt{3}}{2}\right)$

a. $\frac{2\pi}{3}$

b. $\frac{4\pi}{3}$

c. $-\frac{\pi}{3}$

d. $\frac{\pi}{3}$

e. None of these.

3. $\csc\left(\cot^{-1}\left(-\frac{3}{4}\right)\right)$

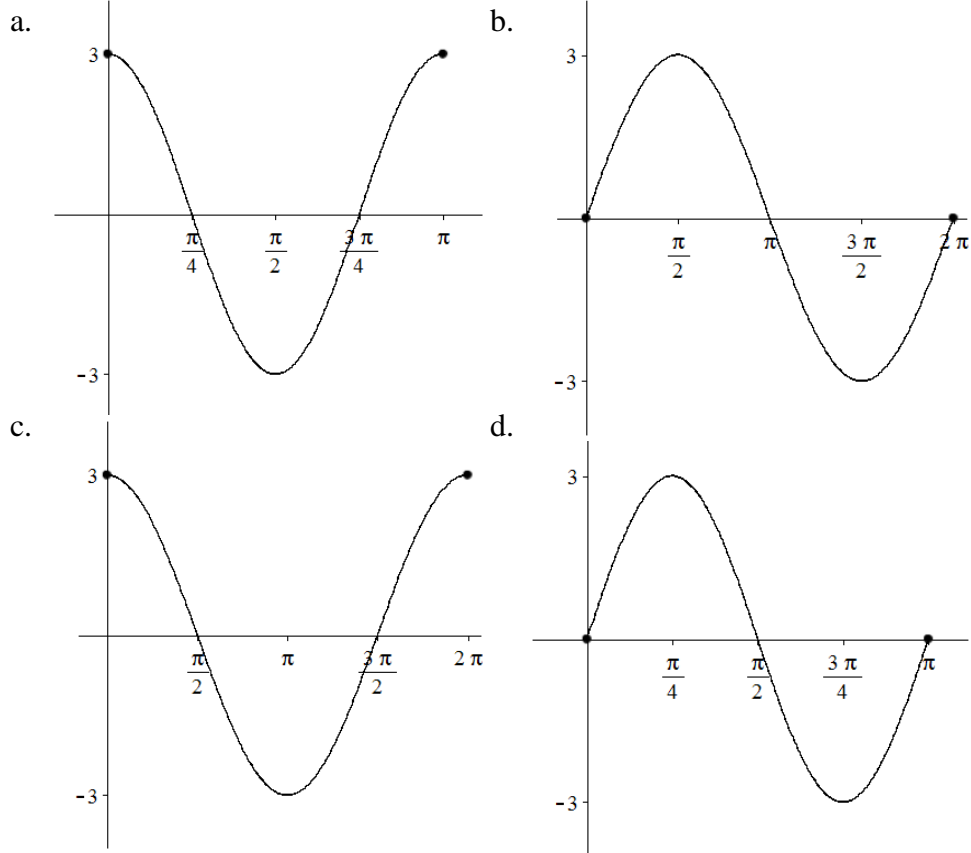
- a. $-\frac{5}{3}$ b. $-\frac{5}{4}$ c. $\frac{5}{3}$
 d. $\frac{5}{4}$ e. None of these.

4. $\tan^{-1}(-1)$

- a. $\frac{7\pi}{4}$ b. $-\frac{\pi}{4}$ c. $-\frac{\pi}{2}$
 d. $-\frac{\pi}{6}$ e. None of these.

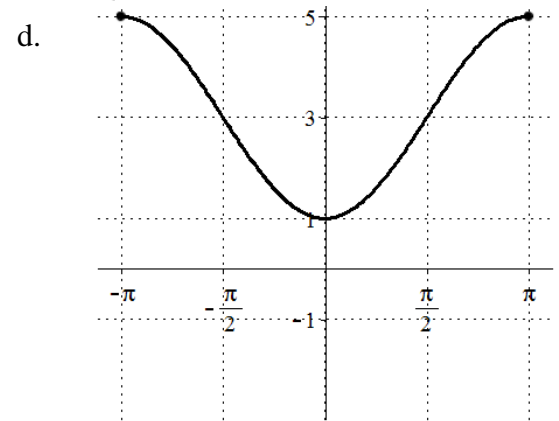
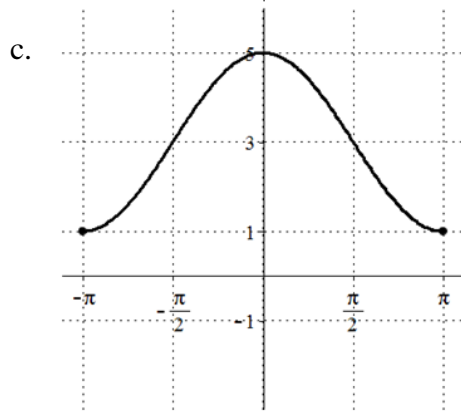
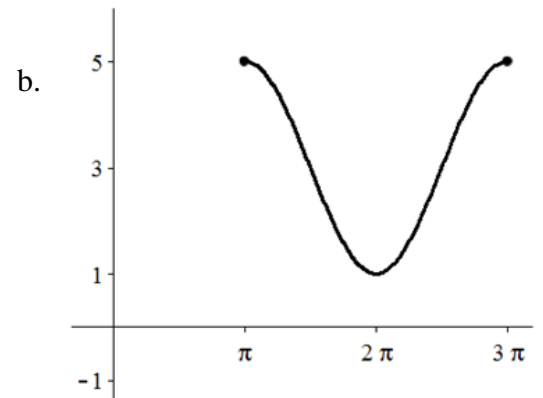
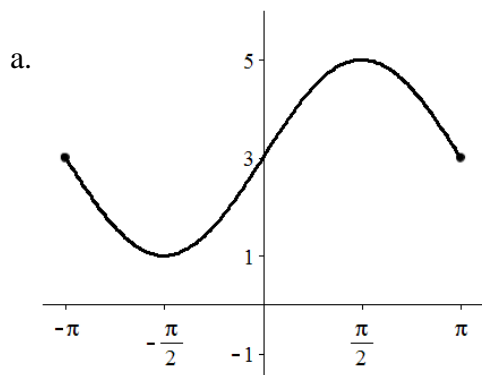
VII. Which of the following is a sketch of one cycle of the graph of each function?

1. $y = 3 \sin 2x$



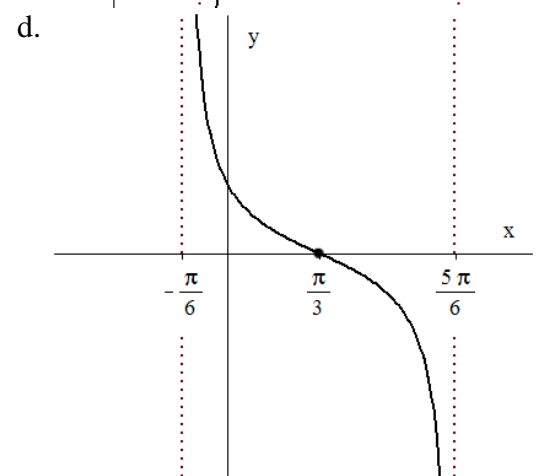
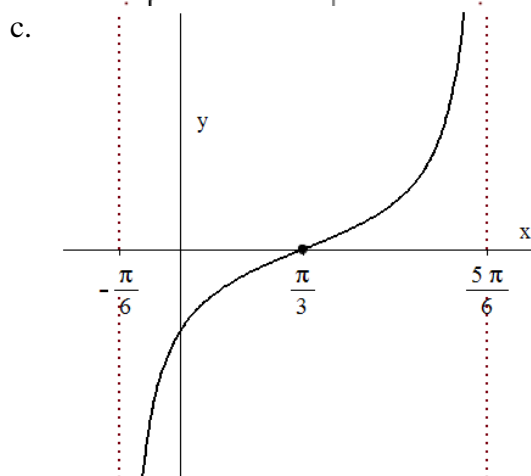
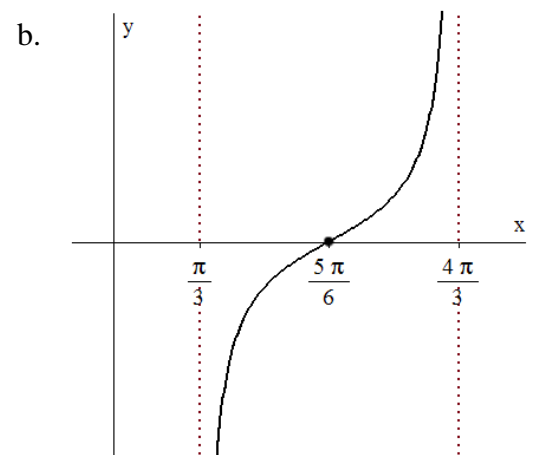
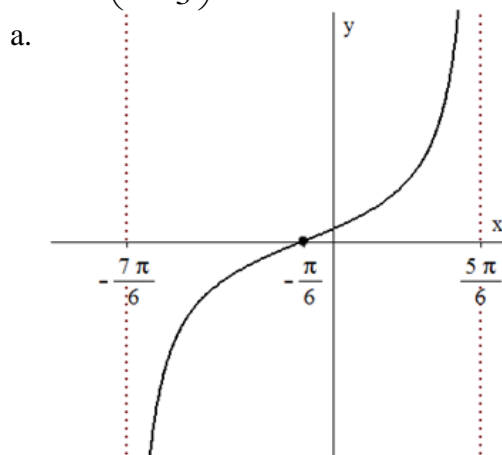
e. None of these.

2. $y = -2 \cos(x + \pi) + 3$



e. None of these.

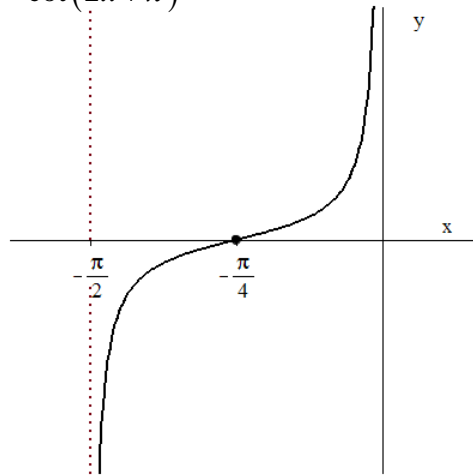
3. $y = \tan\left(x - \frac{\pi}{3}\right)$



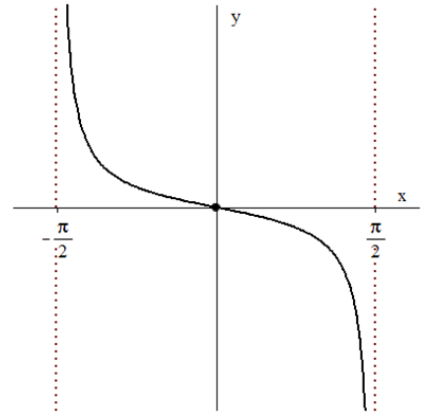
e. None of these.

4. $y = \cot(2x + \pi)$

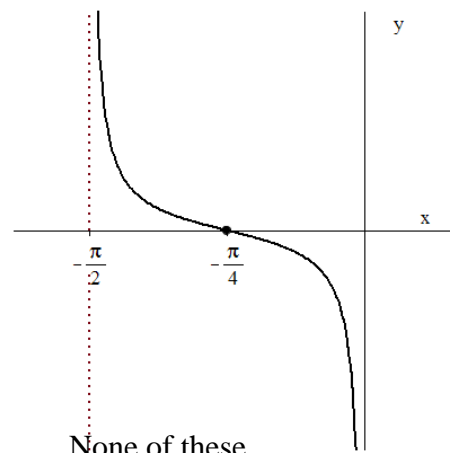
a.



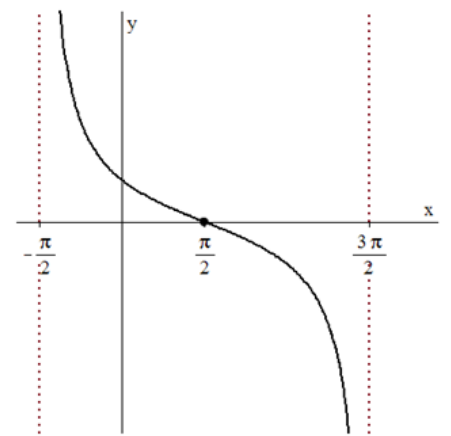
b.



c.



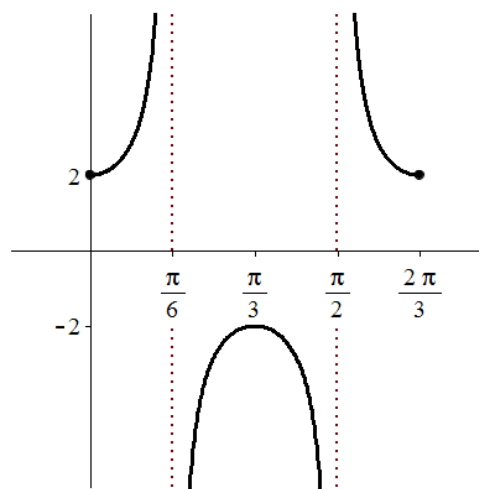
d.



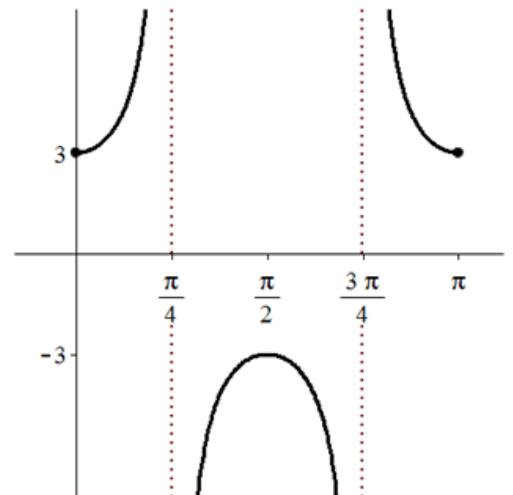
e. None of these.

5. $y = 2 \sec 3x$

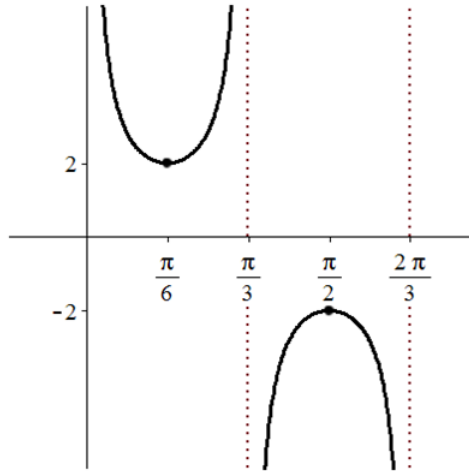
a.



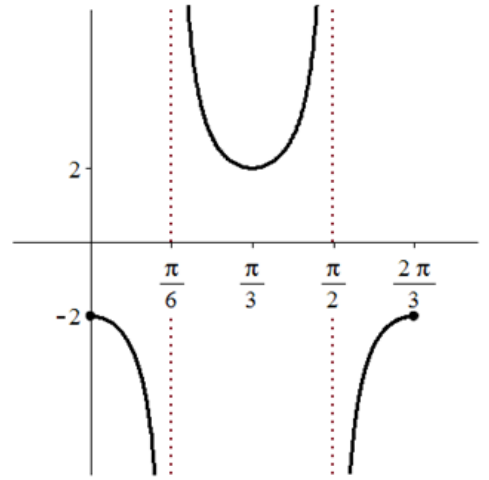
b.



c.



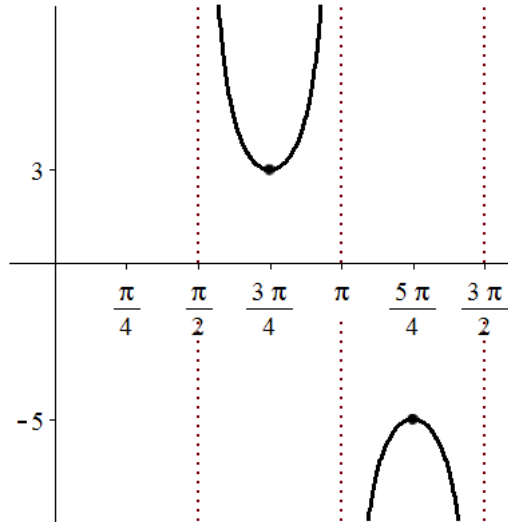
d.



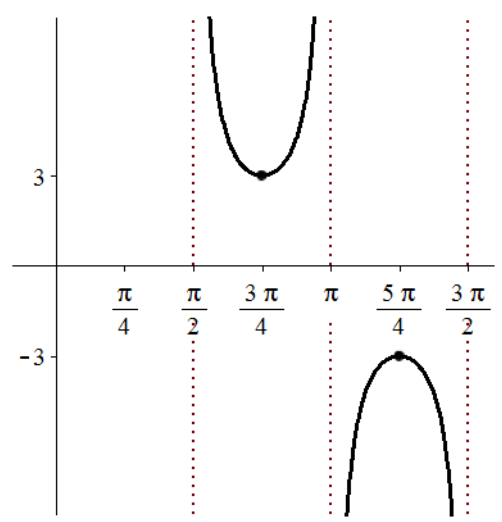
e. None of these.

6. $y = 4\csc(2x - \pi) - 1$

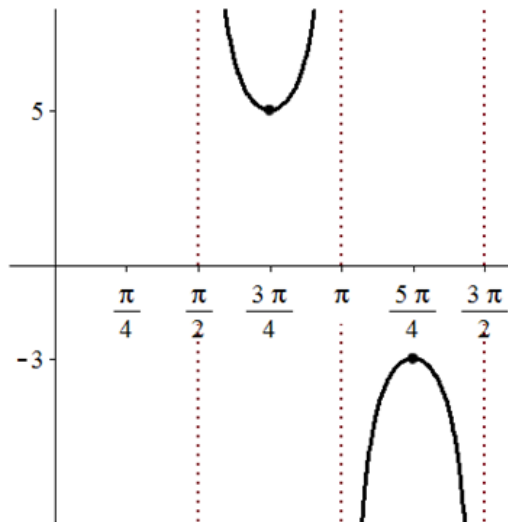
a.



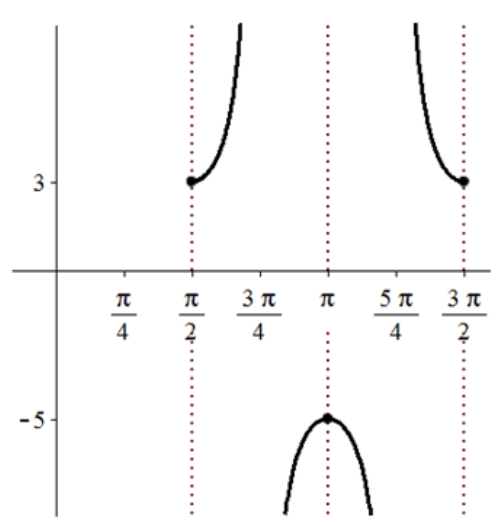
b.



c.



d.



e. None of these.

VIII. Use the sum or difference identities to evaluate each expression.

1. $\cos 75^\circ$

- a. $\frac{\sqrt{2}-\sqrt{6}}{4}$ b. $\frac{\sqrt{2}+\sqrt{6}}{4}$ c. $\frac{\sqrt{6}+\sqrt{2}}{4}$
d. $\frac{\sqrt{6}-\sqrt{2}}{4}$ e. None of these.

2. $\sin 285^\circ$

- a. $\frac{\sqrt{2}-\sqrt{6}}{4}$ b. $\frac{-\sqrt{2}-\sqrt{6}}{4}$ c. $\frac{\sqrt{6}+\sqrt{2}}{4}$
d. $\frac{\sqrt{6}-\sqrt{2}}{4}$ e. None of these

3. $\tan 195^\circ$

- a. $-\sqrt{3}+2$ b. $\sqrt{3}-2$ c. 1
d. $-\sqrt{3}-3$ e. None of these.

IX. Let α be in Quadrant I, β in Quadrant III, $\cos \alpha = \frac{7}{25}$, and $\tan \beta = \frac{5}{12}$.

1. $\cos(\alpha - \beta) = ?$

- a. $\frac{36}{325}$ b. $-\frac{204}{325}$ c. $-\frac{323}{325}$
d. $\frac{204}{325}$ e. None of these.

2. $\sin(\alpha + \beta) = ?$

- a. $-\frac{253}{325}$ b. $\frac{253}{325}$ c. $-\frac{323}{325}$
d. $\frac{204}{325}$ e. None of these.

3. $\tan(\alpha + \beta) = ?$

- a. $-\frac{29}{119}$ b. $\frac{253}{204}$ c. $\frac{3}{17}$

- d. $-\frac{323}{36}$ e. None of these.

X. Change each sum or difference to a product.

1. $\sin 68^\circ + \sin 32^\circ$

- a. $2 \cos 50^\circ \cos 18^\circ$ b. $2 \sin 50^\circ \sin 18^\circ$
c. $2 \cos 50^\circ \sin 18^\circ$ d. $2 \sin 50^\circ \cos 18^\circ$
e. None of these.

2. $\sin 5x - \sin 3x$

- a. $\cos 4x \sin x$ b. $\sin 2x$
c. $2 \cos 8x \sin 2x$ d. $2 \cos 4x \sin x$
e. None of these.

3. $\cos 12x + \cos 5x$

- a. $\cos 17x$ b. $2 \sin \frac{17x}{2} \cos \frac{7x}{2}$
c. $-2 \sin \frac{17x}{2} \sin \frac{7x}{2}$ d. $2 \cos \frac{17x}{2} \cos \frac{7x}{2}$

4. $\cos 20^\circ - \cos 40^\circ$

- a. $\sin 10^\circ$ b. $\sqrt{3} \sin 10^\circ$
c. $-\cos 20^\circ$ d. $\sqrt{3} \cos 10^\circ$
e. None of these.

XI. Let θ be in Quadrant II with $\sec \theta = -\frac{13}{5}$.

1. $\sin 2\theta = ?$

- a. $\frac{24}{13}$ b. $-\frac{120}{169}$ c. $-\frac{60}{169}$
d. $-\frac{10}{13}$ e. None of these

2. $\cos 2\theta = ?$

- a. 1 b. $-\frac{10}{13}$ c. $\frac{119}{169}$
 d. $-\frac{119}{169}$ e. None of these.

3. $\tan 2\theta = ?$

- a. $\frac{120}{119}$ b. $-\frac{24}{5}$ c. $-\frac{120}{119}$
 d. $-\frac{12}{5}$ e. None of these.

XII. Evaluate each of the following expressions using the half-angle identities.

1. $\sin 112.5^\circ$

- a. $\frac{\sqrt{1+\sqrt{2}}}{2}$ b. $\frac{\sqrt{2+\sqrt{2}}}{2}$ c. $\frac{\sqrt{1-\sqrt{2}}}{2}$
 d. $\frac{\sqrt{2-\sqrt{2}}}{2}$

2. $\cos 157.5^\circ$

- a. $\frac{\sqrt{1+\sqrt{2}}}{2}$ b. $\frac{\sqrt{2+\sqrt{2}}}{2}$ c. $-\frac{\sqrt{2+\sqrt{2}}}{2}$
 d. $-\frac{\sqrt{2-\sqrt{2}}}{2}$ e. None of these.

3. $\tan 67.5^\circ$

- a. $-\sqrt{2}-1$ b. $2+\sqrt{2}$ c. $\sqrt{2}+1$
 d. $\sqrt{2}-1$ e. None of these.

XIII. If the terminal side of θ passes through the point $(-3,2)$, find $\sin 2\theta$.

- a. 4 b. $-\frac{12}{13}$ c. $\frac{2\sqrt{13}}{13}$
 d. $-\frac{3\sqrt{13}}{13}$ e. None of these.

XIV. Solve each equation for $0 \leq x < 2\pi$.

1. $\cos 2x = 1 - \sin x$

- a. $0, \frac{\pi}{6}, \frac{5\pi}{6}, \pi$ b. $0, \frac{\pi}{3}, \frac{2\pi}{3}, \pi$ c. $0, \frac{7\pi}{6}, \frac{11\pi}{6}, \pi$
 d. $\frac{\pi}{6}, \frac{5\pi}{6}$ e. None of these.

2. $\sin x \cos x = \frac{1}{2}$

- a. $\frac{\pi}{4}$ b. $\frac{\pi}{3}, \frac{\pi}{2}$ c. $\frac{\pi}{4}, \frac{5\pi}{4}, \frac{\pi}{2}$
 d. $\frac{\pi}{4}, \frac{5\pi}{4}$ e. None of these.

3. $2 \cos^2 x + \sin x - 1 = 0$

- a. $\frac{\pi}{6}, \frac{\pi}{2}, \frac{5\pi}{6}$ b. $\frac{\pi}{3}, \frac{\pi}{2}, \frac{2\pi}{3}$ c. $\frac{\pi}{2}, \frac{7\pi}{6}, \frac{11\pi}{6}$
 d. $\frac{\pi}{6}, \frac{5\pi}{6}, \frac{3\pi}{2}$ e. None of these.

4. $3 \cot^2 2x - 1 = 0$

- a. $\frac{\pi}{6}, \frac{\pi}{3}, \frac{2\pi}{3}, \frac{5\pi}{6}, \frac{7\pi}{6}, \frac{4\pi}{3}, \frac{5\pi}{3}, \frac{11\pi}{6}$ b. $\frac{\pi}{6}, \frac{2\pi}{3}, \frac{7\pi}{6}, \frac{5\pi}{3}$
 c. $\frac{\pi}{3}, \frac{5\pi}{6}, \frac{4\pi}{3}, \frac{11\pi}{6}$
 d. $\frac{\pi}{6}, \frac{5\pi}{6}, \frac{7\pi}{6}, \frac{11\pi}{6}, \frac{13\pi}{6}, \frac{17\pi}{6}, \frac{19\pi}{6}, \frac{23\pi}{6}$ e. None of these.

XV. Solve $\triangle ABC$ for the missing part.

1. $A = 90^\circ, a = 29, b = 21, B = ?$

- a. 43.6° b. 46.4° c. 35.9°
 d. 54.1° e. None of these.

2. $a = 5, b = 8, c = 10, C = ?$

- a. 29.7° b. 97.9° c. 52.4°
 d. 7.9° e. None of these.

3. $A = 40^\circ, b = 6, B = 20^\circ, c = ?$
- a. 15.2 b. 8.1 c. 11.3
- d. 5.6 e. None of these.

XVI. Give the radian measure of an angle that subtends an arc of length $24''$ in a circle of radius $8''$.

- a. 192 b. 3 c. $\frac{1}{3}$
- d. 3π d. None of these.

XVII. Convert $\frac{5\pi}{12}$ to degrees.

- a. 75° b. 432° c. 15°
- d. 3° e. None of these.

XVIII. Convert 260° to radians.

- a. $\frac{9\pi}{13}$ b. $\frac{13\pi}{9}$ c. $\frac{46800}{\pi}$
- d. $\frac{13}{9}$ e. None of these.

XIX. Simplify each expression.

1. $\sin \theta \sec \theta$

- a. $\cot \theta$ b. 1 c. $\sin^2 \theta$
- d. $\tan \theta$ e. None of these.

2. $\cos^2 \theta \tan^2 \theta + \cos^2 \theta$

- a. 1 b. $\cot^2 \theta$ c. $2 \cos^2 \theta \tan^2 \theta$
- d. $\sin^2 \theta$ e. None of these

3. $\frac{\csc \theta + \sec \theta}{\sin \theta + \cos \theta}$

- a. 1 b. $\sin \theta + \cos \theta$ c. $\csc^2 \theta + \sec^2 \theta$
- d. $\csc \theta \sec \theta$ e. None of these.

4. $(\sin x + \cos x)^2$
- a. $\sin 2x$ b. 1 c. $1 + \sin 2x$
- d. $\sin x \cos x$ e. None of these.
5. $\frac{\sec^4 x - \tan^4 x}{\sec^2 x + \tan^2 x}$
- a. $-\tan^2 x$ b. -1 c. $\sec^4 x - \tan^4 x$
- d. 1 e. None of these.
6. $\frac{1 - \sin^2 \theta}{\cot \theta}$
- a. $\cos^3 \theta \sin \theta$ b. $\cot \theta - \sec \theta$ c. $\cos \theta \sin \theta$
- d. $\cot \theta$ e. None of these.

XX. Change the product to a sum.

1. $6 \sin 15^\circ \sin 45^\circ$
- a. $-\frac{3}{2} + \frac{3\sqrt{3}}{2}$ b. $-\frac{3}{2} + \frac{\sqrt{3}}{2}$ c. $-\frac{3}{2} - \frac{3\sqrt{3}}{2}$
- d. $\frac{3\sqrt{3}}{2} - \frac{3}{2}$ e. None of these.
2. $4 \sin 3x \cos 2x$
- a. $2 \cos 5x + 2 \cos x$ b. $2 \sin 5x + 2 \sin x$
- c. $2 \cos 5x - 2 \cos x$ d. $4 \cos 5x + \cos x$
- e. None of these.
3. $\cos 28^\circ \sin 40^\circ$
- a. $\sin 68^\circ - \sin 12^\circ$ b. $\frac{1}{2} \sin 68^\circ - \frac{1}{2} \sin 12^\circ$
- c. $\frac{1}{2} \sin 68^\circ + \frac{1}{2} \sin 12^\circ$ d. $\cos 68^\circ + \cos 12^\circ$

e. None of these.

4. $\cos 7x \cos 5x$

a. $\frac{1}{2} \cos 12x + \frac{1}{2} \cos 2x$

b. $\frac{1}{2} \cos 12x - \frac{1}{2} \cos 2x$

c. $\frac{1}{2} \sin 12x + \frac{1}{2} \sin 2x$

d. $\frac{1}{2} \sin 12x - \frac{1}{2} \sin 2x$

e. None of these.

XXI. Let the point $\left(-\frac{2}{5}, \frac{\sqrt{21}}{5}\right)$ be a point on the terminal side of an angle θ in standard

position. Find the sine and cosine of θ .

a. $\cos \theta = -\frac{2}{5}; \sin \theta = \frac{\sqrt{21}}{5}$

b. $\sin \theta = -\frac{2}{5}; \cos \theta = \frac{\sqrt{21}}{5}$

c. $\cos \theta = -\frac{5}{2}; \sin \theta = \frac{5\sqrt{21}}{21}$

d. $\cos \theta = -5; \sin \theta = \sqrt{21}$

e. None of these.

XXII. For each of the following, give the quadrant in which the terminal ray of θ lies.

1. $\tan \theta < 0$ and $\cos \theta > 0$

a. I

b. II

c. III

d. IV

e. None of these.

2. $\csc \theta > 0$ and $\cot \theta < 0$

a. I

b. II

c. III

d. IV

e. None of these.

XXIII. Give the reference angle for the indicated angle.

1. 211°

a. 149°

b. 59°

c. 31°

d. 391° e. None of these.

2. $\frac{5\pi}{9}$

a. $\frac{\pi}{18}$ b. $\frac{\pi}{9}$ c. $\frac{19\pi}{18}$

d. $\frac{4\pi}{9}$ e. None of these.

3. 2.3

a. $\pi - 2.3$ b. $\pi + 2.3$ c. $\frac{\pi}{2} - 2.3$

d. $\frac{\pi}{2} + 2.3$ e. None of these.

XXIV. Find the quadrant in which the indicated angle lies.

1. $\frac{343\pi}{12}$

a. I b. II c. III

d. IV e. None of these.

2. -278°

a. I b. II c. III

d. IV e. None of these.

3. 5.43

a. I b. II c. III

d. IV e. None of these.

4. $-\frac{213\pi}{5}$

a. I b. II c. III

d. IV e. None of these.

XXV. Which of the following angles are coterminal with the given angle?

1. -43°

- a. 137° b. 677° c. 47°
d. 227° e. None of these.

2. $\frac{13\pi}{12}$

- a. $\frac{37\pi}{12}$ b. $\frac{\pi}{12}$ c. $\frac{25\pi}{12}$
d. $-\frac{13\pi}{12}$ e. None of these.

XXVI. Give the amplitude of the function $f(x) = -7 \cos 5\left(x + \frac{\pi}{3}\right) + 1$.

- a. 1 b. 7 c. 5
d. -7 e. None of these.

XXVII. Give the period of the function $f(x) = 8 \sin 9\left(x - \frac{\pi}{2}\right) + 3$.

- a. 8 b. $\frac{\pi}{2}$ c. $\frac{\pi}{9}$
d. $\frac{2\pi}{9}$ e. None of these.

XXVIII. Give the period of the function $f(x) = -2 \tan 3\left(x + \frac{\pi}{4}\right) + 6$.

- a. π b. $\frac{\pi}{3}$ c. $\frac{\pi}{4}$
d. $\frac{2\pi}{3}$ e. None of these.

XXIX. Given the following data set for $\triangle ABC$, how many triangles can be drawn?

1. $a = 12, b = 20, A = 25^\circ$
- a. 1 b. 2 c. 3
- d. 0 e. None of these.
2. $a = 8, b = 15, A = 33^\circ$
- a. 1 b. 2 c. 3
- d. 0 e. None of these.

XXX. If $\cos \theta = -\frac{5}{7}$, θ in Quadrant III, find the value of $\tan \theta$.

- a. $\frac{2\sqrt{6}}{7}$ b. $\frac{2\sqrt{6}}{5}$ c. $\frac{5}{2\sqrt{6}}$
- d. $\frac{7}{2\sqrt{6}}$ e. None of these.

XXXI. The length of an arc of the unit circle is as given. Name the quadrant within which the terminal point would lie.

1. $t = \frac{3\pi}{5}$
- a. I b. II c. III
- d. IV. e. None of these.
2. $t = -\frac{13\pi}{12}$
- a. I b. II c. III
- d. IV. e. None of these.
3. $t = \frac{205\pi}{9}$
- a. I b. II c. III
- d. IV. e. None of these.

4. $t = 3.78$
- a. I b. II c. III
- d. IV. e. None of these.

XXXII. Give the terminal point on the unit circle for an arc of the length below.

1. $t = \frac{7\pi}{6}$
- a. $\left(-\frac{\sqrt{3}}{2}, \frac{1}{2}\right)$ b. $\left(-\frac{\sqrt{3}}{2}, -\frac{1}{2}\right)$ c. $\left(\frac{1}{2}, -\frac{\sqrt{3}}{2}\right)$
- d. $\left(-\frac{1}{2}, -\frac{\sqrt{3}}{2}\right)$ d. None of these.

2. $t = \frac{3\pi}{4}$
- a. $\left(\frac{\sqrt{2}}{2}, -\frac{\sqrt{2}}{2}\right)$ b. $\left(-\frac{\sqrt{2}}{2}, -\frac{\sqrt{2}}{2}\right)$ c. $\left(-\frac{\sqrt{2}}{2}, \frac{\sqrt{2}}{2}\right)$
- d. $(0, -1)$ d. None of these.

3. $t = \frac{5\pi}{3}$
- a. $\left(-\frac{\sqrt{3}}{2}, \frac{1}{2}\right)$ b. $\left(\frac{\sqrt{3}}{2}, -\frac{1}{2}\right)$ c. $\left(\frac{1}{2}, -\frac{\sqrt{3}}{2}\right)$
- d. $\left(-\frac{1}{2}, -\frac{\sqrt{3}}{2}\right)$ e. None of these.

XXXIV. Complete the following statements:

1. $1 - \sin^2 \theta = \underline{\hspace{2cm}}$
- a. $\tan^2 \theta$ b. $\sin \theta$ c. $-\cos \theta$

d. $\cos^2 \theta$ e. None of these.

2. $\sec^2 \theta - \tan^2 \theta = \underline{\hspace{2cm}}$

a. $\sec \theta - \tan \theta$ b. $\sin \theta$ c. 1

d. $\cos^2 \theta$ e. None of these.

3. $\cos^2 7x - \sin^2 7x = \underline{\hspace{2cm}}$

a. 1 b. $\sin 14x$ c. $\cos 14x$

d. 0 e. None of these.

4. $\sqrt{\frac{1 - \cos 50^\circ}{2}} = \underline{\hspace{2cm}}$

a. $\cos 25^\circ$ b. $\sin 25^\circ$ c. $\sin 100^\circ$

d. $\cos 100^\circ$ e. None of these.

5. $1 + \cot^2 9x = \underline{\hspace{2cm}}$

a. $\csc^2 9x$ b. $\cot^2 10x$ c. $\sec^2 9x$

d. $\cos^2 9x$ e. None of these.

6. $\cos(\theta + \pi) = \underline{\hspace{2cm}}$

a. $\cos \theta$ b. $\sin \theta$ c. $-\sin \theta$

d. $-\cos \theta$ e. None of these.

7. $\sin(\theta + 2\pi) = \underline{\hspace{2cm}}$

a. $\cos \theta$ b. $\sin \theta$ c. $-\sin \theta$

d. $-\cos \theta$ e. None of these.

ANSWERS:

- I. c
II. d
III. 1. d 2. a 3. c 4. c 5. a
6. a 7. b 8. d 9. d 10. a
IV. 1. b 2. a 3. a 4. b 5. b
6. a
V. 1. b 2. d 3. a 4. b
VI. 1. d 2. c 3. d 4. b
VII. 1. d 2. c 3. c 4. a 5. a
6. a
VIII. 1. d 2. c 3. a
IX. 1. b 2. c 3. d
X. 1. d 2. d 3. d 4. a
XI. 1. b. 2. d 3. a
XII. 1. b 2. c 3. c
XIII. b
XIV. 1. a 2. d 3. c 4. a
XV. 1. b 2. b 3. a
XVI. b
XVII. a
XVIII. b
XIX. 1. d 2. a 3. d 4. c 5. d
6. c
XX. 1. a 2. b
XXI. a
XXII. d
XXIII. 1. c 2. d 3. a
XXIV. 1. b 2. a 3. d 4. b
XXV. 1. b 2. a
XXVI. b
XXVII. d
XXVIII. b
XXIX. 1. b 2. d