



MATTHAYOM 5 EXTRA MATHEMATICS  
MIDTERM EXAM TERM 1 /Academic Year 2025

Re Test

Part 1: Multiple Choice (40 items)

1A. Use the definitions of the six trigonometric functions to locate and find the trigonometric functions of any angle in standard position, given a point, other than the origin, on the terminal side of an angle.

1. Which of the following statements is/are true?

- i. If an angle  $\theta$  is in QIII, then  $\tan\theta$  is a positive value.
- ii. The values of all trigonometric functions within QII are negative.
- iii. Any angle that lies in QIV provides a positive value for  $\tan\theta$ .
- iv. If  $\cos\theta > 0$  and  $\sin\theta < 0$ , then the angle  $\theta$  lies in QIV.

a. all of the statements are true	b. only statement i and iv are true
c. only statements ii and iv are true	d. none of the statements are true

2. What is the reference angle of  $\frac{7\pi}{12}$ ?

a. $\frac{\pi}{12}$	b. $\frac{\pi}{4}$
c. $\frac{\pi}{6}$	d. $\frac{5\pi}{12}$

3. Which of the following angles is a CO-TERMINAL angle of  $-485^\circ$ , in the standard position?

a. $185^\circ$	b. $55^\circ$
c. $235^\circ$	d. $125^\circ$

4. If an angle  $\theta$  measures  $270^\circ < \theta < 360^\circ$ , which trigonometric function gives a positive value?

a. $\sin\theta$	b. $\sec\theta$
c. $\tan\theta$	d. $\cot\theta$

5. In which quadrant does a  $-1805^\circ$  angle lie?

a. QI	b. QII
c. QIII	d. QIV

6. Which of the following best describes an angle  $\frac{-49\pi}{18}$  in standard position?

- a.
- b.
- c.
- d.

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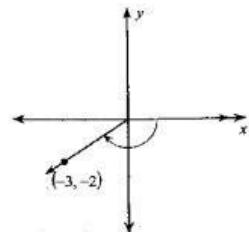
7. Which of the following trigonometric equations is not true?

a.  $\sin^2\theta + \cos^2\theta = 1$       b.  $1 + \cot^2\theta = \csc^2\theta$ .  
c.  $1 + \tan^2\theta = \sec^2\theta$       d.  $\tan^2\theta + 1 = \csc^2\theta$

For items 8- 10, Use the given point on the terminal side of an angle  $\theta$  to find the value of the trigonometric function indicated.

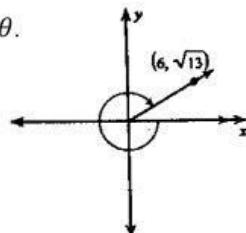
8. Given the diagram on the right , determine the value of  $\cos\theta$ .

a.  $-\frac{6}{5}$       b.  $-\frac{6\sqrt{11}}{11}$   
c.  $-\frac{3\sqrt{13}}{13}$       d.  $\frac{\sqrt{11}}{5}$



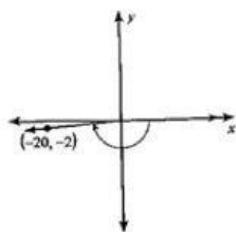
9. Given the diagram on the right, determine the value of  $\csc\theta$ .

a.  $\frac{7\sqrt{13}}{13}$       b.  $-\frac{\sqrt{5}}{5}$ .  
c. 2      d.  $-\frac{\sqrt{5}}{2}$ .



10. Given the diagram on the right, determine the value of  $\sin\theta$ .

a.  $-\frac{2}{13}$       b.  $\frac{2\sqrt{173}}{173}$   
c.  $-\frac{\sqrt{101}}{101}$       d.  $\frac{1}{10}$



1B. Apply the properties of unit circle and definitions of circular functions and find the values of the other trigonometric functions given the value of one trigonometric function.

11. Which of the following is equivalent to  $\tan(-\theta)$ ?

a.  $-\tan\theta$       b.  $\tan\theta$       c.  $\cot\theta$       d.  $\sec\theta$

For items 12 -13:

Given  $\csc\theta = -\frac{25}{7}$  and  $\cos\theta < 0$  , find the following:

12. What is the value of  $\sin\theta$  ?

a.  $-\frac{7}{25}$       b.  $-\frac{7\sqrt{10}}{10}$       c.  $\frac{7}{25}$       d.  $\frac{7\sqrt{10}}{10}$

13. What is the value of  $\tan\theta$  ?

a.  $\frac{7}{24}$       b.  $-\frac{7}{24}$       c.  $\frac{24}{7}$       d.  $\frac{\sqrt{10}}{7}$

*SP*

For items 14 – 15 :

Given  $\sin\theta = \frac{\sqrt{6}}{3}$  and  $\cos > \theta$ , find the following:

14. What is the value of  $\sec\theta$  ?

a.  $\sqrt{3}$       b.  $\frac{\sqrt{3}}{3}$       c. 3      d.  $\frac{1}{6}$

15. What is the value of  $\cot\theta$  ?

a.  $\frac{\sqrt{2}}{2}$       b.  $\frac{\sqrt{6}}{2}$       c.  $\frac{1}{6}$       d.  $\frac{1}{3}$

1C. Able to find the values of trigonometric functions of the special angles and their related angles as found in the unit circle.

16. Which of the following has the exact same value as  $\tan 120^\circ$  ?

a.  $\tan(-120^\circ)$       b.  $\tan(-60^\circ)$   
c.  $\tan 60^\circ$       d.  $-\tan 60^\circ$

17. Which of the following is the exact value of  $\sin 153^\circ \cos 63^\circ - \cos 153^\circ \sin 63^\circ$  ?

a. 1      b.  $\frac{1}{2}$   
c. 0      d.  $-\frac{\sqrt{3}}{2}$

18. Which of the following expression is equivalent to  $\tan(135^\circ + 30^\circ)$  ?

a.  $\frac{\tan 135^\circ + \tan 30^\circ}{1 + \tan 135^\circ \tan 30^\circ}$       b.  $\frac{\tan 135^\circ - \tan 30^\circ}{1 + \tan 135^\circ \tan 30^\circ}$   
c.  $\frac{\tan 135^\circ + \tan 30^\circ}{1 - \tan 135^\circ \tan 30^\circ}$       d.  $\frac{\tan 135^\circ - \tan 30^\circ}{1 - \tan 135^\circ \tan 30^\circ}$

19. What is the exact value of  $\cos \frac{11\pi}{12}$ , in its simplest form?

a.  $\sqrt{3} - 2$       b.  $\frac{-\sqrt{6} - \sqrt{2}}{4}$       c.  $\frac{\sqrt{6} - \sqrt{2}}{4}$       d.  $\frac{\sqrt{6} + \sqrt{2}}{4}$

20. Which of the following is the exact value of  $\cos 202^\circ \cos 52^\circ + \sin 202^\circ \sin 52^\circ$  ?

a.  $\sqrt{3}$       b.  $-\frac{\sqrt{3}}{2}$       c.  $-\frac{1}{2}$       d.  $\frac{1}{2}$

21. What is the exact value of  $\sin 195^\circ$  ?

a.  $\frac{\sqrt{6} + \sqrt{2}}{4}$       b.  $\frac{\sqrt{6} - \sqrt{2}}{4}$       c.  $2 - \sqrt{3}$       d.  $\frac{\sqrt{2} - \sqrt{6}}{4}$

22. Which of the following trigonometric functions has the value undefined?

*SK*

a.  $\csc 180^\circ$

b.  $\cot 90^\circ$

c.  $\cos 180^\circ$

d.  $\sec 180^\circ$

1D. Solve trigonometric equations using trigonometric identities.

23. Simplify the expression:  $\cos 2x \cos x + \sin 2x \sin x$

a.  $\cos x$

b.  $\sin 3x$

c.  $\cos(-8x)$

d.  $\cos 5x$

24. Simplify the expression: 
$$\frac{\tan 6\theta + \tan(-4\theta)}{1 - \tan 6\theta \tan(-4\theta)}$$

a.  $\tan 8\theta$

b.  $\tan(-\theta)$

c.  $\tan 10\theta$

d.  $\tan 2\theta$

25. Solve the equation:  $-\cos 2\theta = 2 - 3\cos\theta$  for  $\theta$ , where  $0^\circ \leq \theta \leq 360^\circ$

a.  $\{0^\circ, 60^\circ, 300^\circ\}$

b.  $\{45^\circ, 135^\circ, 225^\circ, 315^\circ\}$

c.  $\{0^\circ, 60^\circ, 90^\circ, 300^\circ\}$

d.  $\{0^\circ, 60^\circ\}$

26. Solve the equation:  $-3 - 3\csc\theta = \cot^2\theta$  for  $\theta$ , where  $0^\circ \leq \theta \leq 360^\circ$

a.  $\{210^\circ, 270^\circ, 330^\circ\}$

b.  $\{240^\circ, 300^\circ\}$

c.  $\{60^\circ, 180^\circ, 300^\circ\}$

d.  $\{30^\circ, 150^\circ, 210^\circ, 330^\circ\}$

27. Solve the equation:  $\sin 2\theta = -\sqrt{3}\cos\theta$  for  $\theta$ , where  $0^\circ \leq \theta \leq 360^\circ$ .

a.  $\{30^\circ, 90^\circ, 150^\circ\}$

b.  $\{90^\circ, 240^\circ, 270^\circ, 300^\circ\}$

c.  $\{60^\circ, 120^\circ, 240^\circ, 300^\circ\}$

d.  $\{0^\circ, 120^\circ\}$

28. Solve the equation:  $7 = 6 + \sin^2\theta$  for  $\theta$ , where  $0^\circ \leq \theta \leq 360^\circ$

a.  $\{30^\circ, 150^\circ, 210^\circ, 330^\circ\}$

b.  $\{90^\circ, 210^\circ, 330^\circ\}$

c.  $\{45^\circ, 225^\circ\}$

d.  $\{90^\circ, 270^\circ\}$

29. Solve the equation:  $3\sin^2\theta + 2 + 4\sin\theta = \cos^2\theta$  for  $\theta$ , where  $0^\circ \leq \theta \leq 360^\circ$

a.  $\{210^\circ\}$

b.  $\{90^\circ, 210^\circ\}$

c.  $\{210^\circ, 330^\circ\}$

d.  $\{0^\circ, 120^\circ, 240^\circ\}$

30. Given:  $\cos A = \frac{1}{3}$ , where  $0^\circ < A < 90^\circ$  and  $\sin B = \frac{1}{4}$  where  $90^\circ < B < 180^\circ$ .

Find  $\sin(A + B)$ .

a.  $\frac{2-3\sqrt{30}}{24}$

b.  $\frac{1-2\sqrt{30}}{12}$

c.  $\frac{-1+\sqrt{30}}{12}$

d.  $\frac{1-\sqrt{30}}{12}$

3/4

**1E. Characteristics and graphs of trigonometric functions.**

For items 31 – 35:

Refer to the function  $y = -4 \sin(2\theta + 270) - 1$

31. What is the period of the function given above?

a.  $360^\circ$       b.  $270^\circ$       c.  $180^\circ$       d.  $720^\circ$

32. What is the amplitude of the function above?

a. 4      b. -4      c. -1      d. 1

33. What is the maximum value of the function?

a. -5      b. 3      c. -3      d. 5

34. What is the minimum value of the function?

a. -3      b. -4      c. 3      d. -5

35. What is the phase shift of the function?

a.  $270^\circ$  to the left      b.  $270^\circ$  to the right      c.  $135^\circ$  to the left      d.  $135^\circ$  to the right

36. Which of the following is an equation of a sine function that has the following characteristics?

Amplitude = 3

Period =  $180^\circ$

Phase shift:  $60^\circ$  to the right

a.  $y = 3\sin(2\theta + 60)$

b.  $y = 3\sin(\frac{\theta}{2} + 60)$

c.  $y = 3\sin(2\theta - 60)$

d.  $y = 3\sin(2\theta - 120)$

37. Which of the following is NOT TRUE about the characteristics of the graph of a tangent function?

a. There is no maximum value.

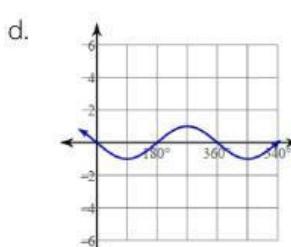
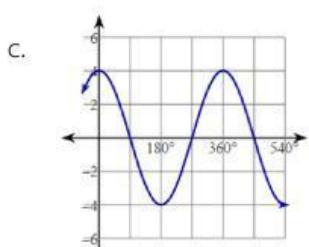
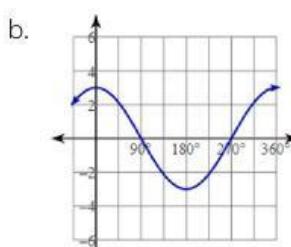
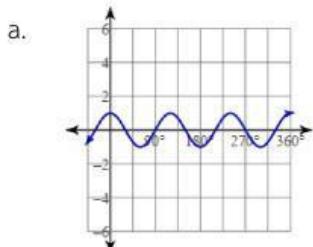
b. There is no minimum value.

c. The amplitude of a tangent function is always positive.

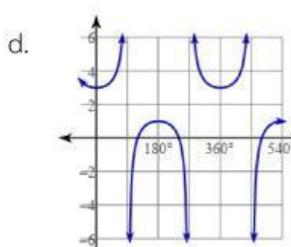
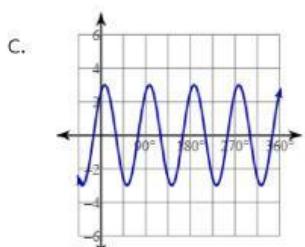
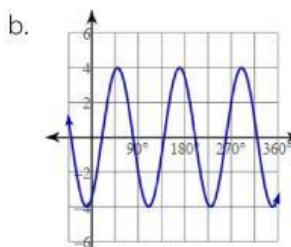
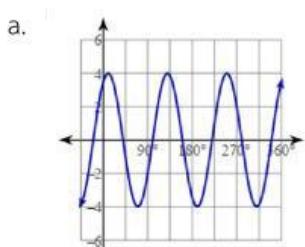
d. The graph of a tangent function is a periodic function with a period of  $180^\circ$ .



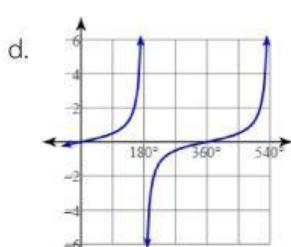
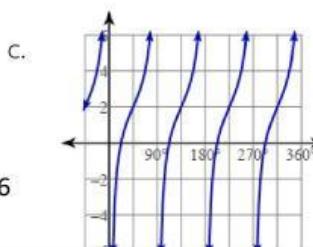
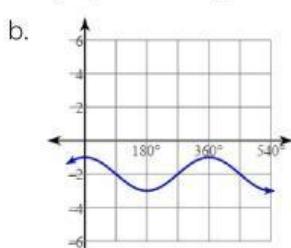
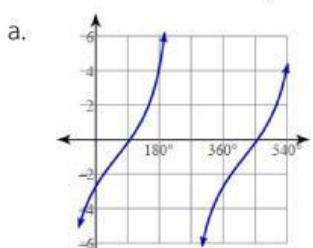
38. Which of the following describes the graph of  $y = \cos 3\theta$ ?



39. Which of the following best describes the graph of  $y = 4\sin(3\theta + 60)$ ?



40. Which of the following DOES NOT characterize the graph of a tangent function?



Part 2. Find the following characteristics. (Bonus 10 pts.)

2.2.1.  $y = 2\sin(4\theta - 45)$

Amplitude : \_\_\_\_\_

Period: \_\_\_\_\_

Vertical shift \_\_\_\_\_

Phase shift \_\_\_\_\_

Maximum value \_\_\_\_\_

Minimum value \_\_\_\_\_

2.2.2.  $y = 3\cos(3\theta - 120) + 2$

Amplitude : \_\_\_\_\_

Period: \_\_\_\_\_

Vertical shift \_\_\_\_\_

Phase shift \_\_\_\_\_

Maximum value \_\_\_\_\_

Minimum value \_\_\_\_\_

Drag and drop the answers on the space provided.

2

2

2

-2

-1

3

5

None/ 0

$90^\circ$

$11.25^\circ$  to the right

$40^\circ$  to the right

$11.25^\circ$  to the left

$40^\circ$  to the left

$120^\circ$

