

Angles, Radian Measure, and the Unit Circle

Angle measure, radian fluency, and the unit-circle definitions of trig functions.

Name _____ Date _____

32 main 2-up grid 2 pages

Completion Reward



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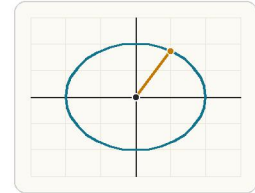
1. What does one radian measure compare?

- A. Diameter to circumference
- B. Slope to intercept
- C. Area to perimeter
- D. Arc length to radius length

2. Which direction is positive rotation in standard position?

- A. Clockwise
- B. Straight down
- C. Toward the y-axis only
- D. Counterclockwise

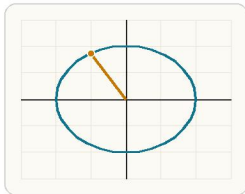
3. On the unit circle, what coordinates match angle t ?



For an angle t on the unit circle, the x-coordinate is $\cos(t)$ and the y-coordinate is $\sin(t)$.

- A. $(\cos(t), \sin(t))$
- B. $(\sin(t), \cos(t))$
- C. $(\tan(t), 1)$
- D. $(1, \tan(t))$

4. In Quadrant II, which trig values have the same sign pattern as the point coordinates?



In Quadrant II, x is negative and y is positive, so cosine is negative while sine is positive.

- A. cosine positive and sine positive
- B. cosine negative and sine negative
- C. cosine negative and sine positive
- D. cosine positive and sine negative

5. What is a reference angle?

- A. The angle between the terminal side and the y-axis
- B. The acute angle between the terminal side and the x-axis
- C. The angle from the negative x-axis only
- D. The angle after one full rotation

6. What makes two angles coterminal?

- A. They have the same reference angle only.
- B. They end at the same terminal side.
- C. They are both acute.
- D. They add to 180 degrees.

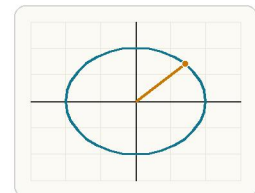
7. Which angle ends at the point $(0, 1)$ on the unit circle?

- A. 45 degrees
- B. 90 degrees
- C. 180 degrees
- D. 270 degrees

8. Which angle ends at the point $(-1, 0)$ on the unit circle?

- A. 180 degrees
- B. 90 degrees
- C. 270 degrees
- D. 360 degrees

9. Which coordinates match angle $\pi / 4$?



The $\pi / 4$ point lies equally far in x and y from the axes, so cosine and sine are equal there.

- A. $(1 / 2, \sqrt{3} / 2)$
- B. $(0, 1)$
- C. $(\sqrt{2} / 2, \sqrt{2} / 2)$
- D. $(-\sqrt{2} / 2, \sqrt{2} / 2)$

10. Which coordinates match angle $2\pi / 3$?

- A. $(1 / 2, \sqrt{3} / 2)$
- B. $(-\sqrt{3} / 2, 1 / 2)$
- C. $(-1 / 2, \sqrt{3} / 2)$
- D. $(\sqrt{3} / 2, -1 / 2)$

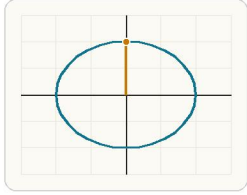
11. Which angle ends at the point $(0, -1)$?

- A. $3\pi / 2$
- B. $\pi / 2$
- C. π
- D. 2π

12. Which angle is coterminal with 30 degrees?

- A. 150 degrees
- B. 390 degrees
- C. 60 degrees
- D. -30 degrees

13. At which angle is $\tan(\theta)$ undefined?



Since $\tan(\theta) = \sin(\theta) / \cos(\theta)$, tangent is undefined at angles where the x-coordinate on the unit circle is 0.

- A. $\pi / 4$
- B. $\pi / 6$
- C. 0
- D. $\pi / 2$

16. Convert $\pi / 3$ radians to degrees. Answer with a number.

19. Find $\cos(\pi / 3)$. Enter as a decimal. Answer with a number.

22. On the unit circle, what arc length matches angle $\pi / 2$? Answer with a number.

25. Convert 60 degrees to radians. Answer as an exact expression.

28. State the unit-circle coordinates for angle π . Answer as an ordered pair.

31. Find $\cos(5\pi / 6)$. Answer as an exact value.

14. What is the best first step when finding $\sin(5\pi / 6)$?

- A. Square the angle.
- B. Differentiate the function.
- C. Identify the reference angle and the quadrant.
- D. Take the reciprocal of the angle.

17. Convert $3\pi / 2$ radians to degrees. Answer with a number.

20. Find $\tan(\pi / 4)$. Answer with a number.

23. How many degrees separate two coterminal angles? Answer with a number.

26. Convert 225 degrees to radians. Answer as an exact expression.

29. Convert 135 degrees to radians. Answer as an exact expression.

32. Find $\tan(2\pi / 3)$. Answer as an exact value.

15. A student says $\cos(2\pi / 3)$ is positive because the angle is in Quadrant II. What is the mistake?

- A. Cosine matches the x-coordinate, which is negative in Quadrant II.
- B. Quadrant II has both coordinates positive.
- C. Cosine always matches the y-coordinate.
- D. Cosine is undefined in Quadrant II.

18. Find $\sin(\pi / 6)$. Enter as a decimal. Answer with a number.

21. Find the reference angle of 210 degrees. Answer in degrees.

24. Which student correctly finds the reference angle of 300 degrees?

- A. Student B: $300 - 180 = 120$ degrees.
- B. Student C: $300 + 60 = 360$ degrees so the answer is 360 degrees.
- C. Student A: $360 - 300 = 60$ degrees.
- D. Student D: The reference angle is 300 degrees.

27. State the unit-circle coordinates for angle $\pi / 2$. Answer as an ordered pair.

30. Find $\sin(5\pi / 6)$. Answer as an exact value.