Trigonometry Final Exam

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MATH

Trigonometry Final Exam

This exam is comprehensive over the entire course and includes 12 questions. You have 60 minutes to complete the exam.

The exam is worth 100 points. The 8 multiple choice questions are worth 5 points each (40 points total) and the 4 free response questions are worth 15 points each (60 points total).

Mark your multiple choice answers on this cover page. For the free response questions, show your work and make sure to circle your final answer.

1. (5 pts) A B C D E

2. (5 pts) A B C D E

3. (5 pts) A B C D E

4. (5 pts) A B C D E

5. (5 pts) A B C D E

6. (5 pts) A B C D E

7. (5 pts) A B C D E

8. (5 pts) A B C D E

1. **(5 pts)** A motorcycle whose wheels are 18 inches in diameter is traveling at 72 miles per hour. What is the angular velocity ω in revolutions per second?

A 140.8 rev/sec

C 18.0 rev/sec

E 4.0 rev/sec

B 70.4 rev/sec

D 9.0 rev/sec

2. **(5 pts)** If a circle has diameter of 20 cm, what is the area A (in square centimeters) of the sector with a central angle of $120°$?

A $A = 100\pi$

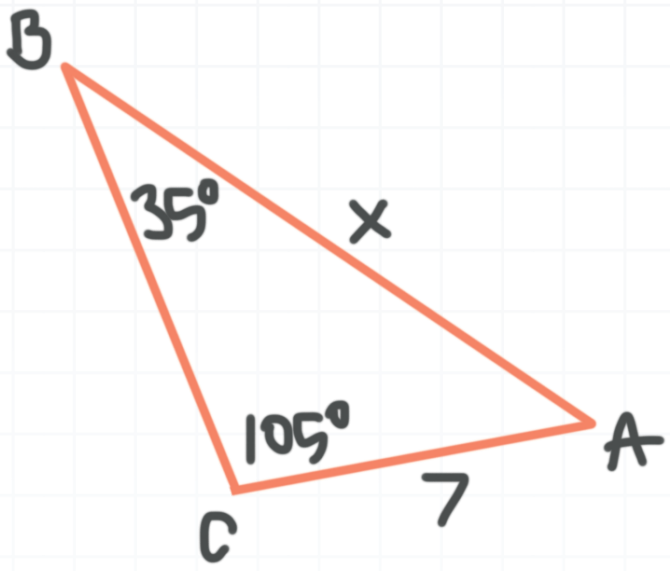
C $A = \frac{3}{20}\pi$

E $A = \frac{20}{3}\pi$

B $A = \frac{10}{3}\pi$

D $A = \frac{100}{3}\pi$

3. **(5 pts)** Use the law of sines to solve for x.



A	16.0	C	11.8	E	3.1
B	7.0	D	13.7		

4. **(5 pts)** What is the period of the function?

$$y = -3\tan\left(\frac{\theta}{6}\right)$$

A	6π	C	2π	E	$\frac{\pi}{2}$
B	8π	D	$\frac{\pi}{6}$		

5. **(5 pts)** What is the area of the triangle with side lengths 15, 17, and 26?

A 154

B 121

C 126

D 252

E 198

6. **(5 pts)** What is the exact value of $\tan(7\pi/6)$?

A $\frac{1}{2}$

B $-\frac{\sqrt{3}}{2}$

C $-\frac{1}{2}$

D $\frac{\sqrt{3}}{3}$

E $-\frac{\sqrt{3}}{3}$

7. **(5 pts)** What is the exact value of $\cos(105°)$?

A $\dfrac{\sqrt{6}-\sqrt{2}}{4}$

B $\dfrac{\sqrt{3}-1}{2}$

C $\dfrac{\sqrt{3}+1}{2}$

D $\dfrac{\sqrt{6}-\sqrt{2}}{2}$

E $\dfrac{\sqrt{2}-\sqrt{6}}{4}$

8. **(5 pts)** Write the equation of a sine function with a vertical stretch of 2, horizontal compression of 5, downward shift of 3, and a shift to the left of $\pi/4$.

A $y = 2\sin\left(5\theta + \dfrac{\pi}{4}\right) - 3$

B $y = 4\sin\left(\dfrac{\theta}{3} + \dfrac{\pi}{4}\right) + 5$

C $x = \dfrac{1}{4}\sin\left(3\theta + \dfrac{\pi}{4}\right) - 5$

D $x = 4\sin\left(3\theta + \dfrac{\pi}{4}\right) + 5$

E $x = 4\sin\left(\dfrac{\theta}{3} - \dfrac{\pi}{4}\right) + 5$

9. **(15 pts)** A drone is flying at an altitude of 250 feet above the ground. The pilot sights an object on the ground at an angle of depression of $42°$. What is the distance from the airplane to the object?

10. **(15 pts)** Convert $45°32'16''$ to degrees.

11. **(15 pts)** Sketch the graph of $y = -4\sin(4x)$, making sure to include two complete periods in the sketch.

12. **(15 pts)** Solve for the unknown values in the triangle.