PRECALCULUS FINAL EXAM REVIEW PART 2

1. Find the exact value of cos 105°.

2. If α and β are the measures of two first quadrant angles and $\sin \alpha = \frac{4}{5}$ and $\sin \beta = \frac{5}{13}$, find $\sin(\alpha + \beta)$.

3. If $\sin \theta = -\frac{3}{5}$ and θ terminates in the fourth quadrant, find the exact value of $\tan 2\theta$.

4. Use a half-angle identity to find the exact value of tan 105°.

5. Solve: $\tan x = \cot x$ for $0 \le x \le \pi$.

6. Solve: $\tan x \sec x - 2\tan x = 0$ for all real values of $0 \le X \le 2\pi$

7. $4\sin^2 x - 4\sin x + 1 = 0$ for all real values of $0 \le X \le 2\pi$

8. Identify the ordered pair that represents the vector from $A(-5, 6)$ to $B(-3, -2)$ and the magnitude of $\overrightarrow{AB}$.

9. Given vectors $\vec{u} = -3\vec{i} + 4\vec{j}$ and $\vec{v} = 6\vec{i} + 8\vec{j}$, find $7\vec{u} - 10\vec{v}$ in terms of unit vectors $\vec{i}$ and $\vec{j}$.

10. Forces of 18 pounds and 20 pounds act on an object at an angle of 120°. Find the magnitude of the resultant force.

11. Without the wind, a plane would fly due east at a rate of 150 mph. The wind is blowing southeast at a rate of 50 mph. The wind is blowing at a 45° angle from due east. What is the actual speed of the plane with the wind?

12. Write a vector equation of the line that passes through $P(3, 1)$ and is parallel to $\vec{a} = \langle 7, 5 \rangle$.

13. Write an equation in slope-intercept form of the line with the given parametric equations.
    $x = 5t - 4$
    $y = 7t + 3$

14. Set up a table of values and then graph the line from its parametric form.

    $x = 9 + 6t$

    $y = -3 + 3t$

15. A rock is tossed at an initial velocity of 60 m/s at an angle of 10° with the ground. After 0.9 second, how far has the rock traveled horizontally and vertically?

16. A toy rocket is launched at an initial velocity of 50 ft/s at an angle of 75° with the horizontal. How long will it take for the rocket to travel 20 feet horizontally?

17. Name the polar coordinates of the point graphed below.
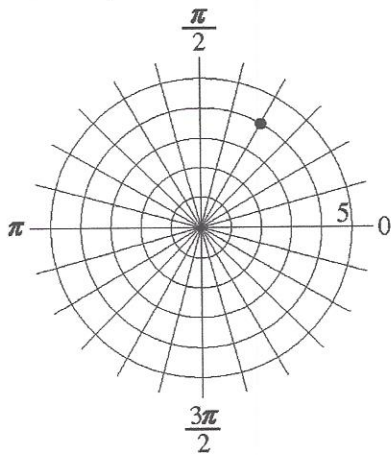
18. Find the polar coordinates of (7, 7) for $r > 0$.

19. Find the rectangular coordinates of $\left(9,\ 150°\right)$.

20. Determine the polar form of the complex number $5 - 2i$. Express the angle θ in degrees, where $0 \leq \theta \leq 360°$, and round numerical entries in the answer to two decimal places.