162 Test 3 Name: ______________________________

1. Using the addition angle formula for cosine, find:
   $\cos(\frac{\pi}{4} + \frac{\pi}{3})$

2. Using the subtraction angle formula for sine, show:
   $\sin(x - \frac{\pi}{2}) = \cos(x)$

3. Find the exact value of $\cos(2\theta)$ given that $\cos(\theta) = \frac{5}{12}$

4. Suppose $\sin(\alpha) = \frac{1}{2}, \cos(\beta) = \frac{3}{5}$ with α, β both in Quadrant I. Find $\sin(\alpha - \beta)$

5. Find $\sin\left(2\cos^{-1}(\frac{4}{5})\right)$

6. Solve for $x : 2\sin^2(x) - 1 = 0$ in the interval $[0, 2\pi)$

7. Solve for $x : 2\sin(x)\cos(x) - \sin(x) = 0$ in the interval $[0, 2\pi)$

8. Simplify: $\tan^2(x)(1 - \sin^2(x))$

9. Add and simplify: $\dfrac{1}{1 + \cos(x)} + \dfrac{1}{1 - \cos(x)}$

10. Multiply: $(4 - 2i)(4 + 2i)$

11. Solve for x and write your answer in standard form: $x^2 - 8x + 20 = 0$

12. Find $|1 + i|$

13. Find the argument of $1 + i$, that is, find θ

14. Use your answers above to write $1 + i$ in trigonometric form, i.e write

$$2 - 2i = r\left(\cos(\theta) + i\sin(\theta)\right)$$

15. Use the trigonometric form to raise $1 + i$ to the power of 4, i.e. Find: $(1 + i)^4$

16. Convert your answer to standard form.

17. Find the three cube roots of -1. Hint: one of the the solutions is -1.