

MATH 5

Practice Test 3

- No notes, books, or calculators are allowed.
 - Please show all your work.
 - Simplify your answers whenever possible and as much as possible (without using a calculator). Note: in some problems you will have to leave radicals, trigonometric functions, etc. in your answers.
1. Simplify: $(1 + i)(2 - 3i)$
 2. Simplify: $\frac{10 - 5i}{1 + 2i}$
 3. Plot the number $4 - 3i$ and find its modulus.
 4. Plot the number $-2 - 2i$ and find its trigonometric form.
 5. Simplify: $\cos(75^\circ)\sin(105^\circ)$.
 6. Solve the equation for x in the interval $[0, 2\pi)$: $\sin(5x) - \sin(x) = 0$.
 7. If the angle of elevation of a 50 m tall lighthouse from a boat is 10° , determine the distance from the boat to the lighthouse.
 8. In a traditionally labeled $\triangle ABC$, $a = 7$, $b = 4$, and $\angle\gamma = \frac{\pi}{4}$. Find c , $\angle\alpha$, and $\angle\beta$.
 9. In $\triangle ABC$, $AB = 6$, $\angle\alpha = 60^\circ$, and $\angle\beta = 75^\circ$. Find AC , BC , and $\angle\gamma$.
 10. Find the area of the triangle in problem 9.
 11. Find the area of a sector with radius 12 cm and central angle $\frac{3\pi}{4}$.
 12. Find the volume of the cone with circular base of radius 8 units and angle of elevation 60° .
 13. Plot the point with polar coordinates $\left(2, \frac{5\pi}{6}\right)$ and find its rectangular coordinates.
 14. Plot the point with rectangular coordinates $(0, -5)$ and find its polar coordinates.
 15. Sketch the graph of the equation $r = 3$.