Math 4 Honors
Lesson 4-6 Learning Check

Name _____
Date Key

In this learning check, you will be assessed the following learning goals:

- *Given a complex number in standard form or rectangular form, I can you re-express it in trigonometric or polar form and vice versa.*
- *I can find the product and quotient of two complex numbers expressed in trigonometric form.*

1. Write the following number in **trigonometric form**. *Round to the nearest 100th.*

$z = -8 - 6i$ $\quad r = \sqrt{64 + 36} = \sqrt{100} = 10$

$\tan\theta = \frac{-6}{-8} = 36.87°$

III

$z = 10(\cos 216.87° + i \sin 216.87°)$

2. Write the following number in **standard form**. *Keep your answer exact.*

$s = 10\left(\cos\frac{11\pi}{6} + i\sin\frac{11\pi}{6}\right)$

$s = 10\cos\frac{11\pi}{6} + 10i\sin\frac{11\pi}{6}$

$= \cancel{10}^{5} \cdot \frac{\sqrt{3}}{\cancel{2}_{1}} + 10i \cdot -\frac{1}{2}$

$s = 5\sqrt{3} - 5i$

3. Consider the following two numbers: $w = 30(\cos 150° + i\sin 150°)$ and $v = 5(\cos 105° + i\sin 105°)$

a. Calculate $w \bullet v$. Write your answer in **polar form**.

$wv = 150(\cos 255° + i\sin 255°)$

$= [150, 255°]$

b. Calculate $\frac{w}{v}$. Write your answer in **rectangular form**.

$\frac{w}{v} = 6(\cos 45° + i\sin 45°)$

$= 6\cos 45° + 6i\sin 45°$

$= 6 \cdot \frac{\sqrt{2}}{2} + 6 \cdot \frac{\sqrt{2}}{2} i$

$= 3\sqrt{2} + 3\sqrt{2} i$

$= (3\sqrt{2}, 3\sqrt{2})$