Name: _____ Date: _____

Learning Goal 5.1	Express an entire radical as a simplified mixed radical and vice versa. Identify and order irrational numbers.

Convert each mixed radical into an entire radical. State the values of the variable for which the radical is a real number.

1. $4\sqrt{3} = \sqrt{4^2 \times 3}$
$= \sqrt{16 \times 3}$
$= \sqrt{48}$

2. $j^3\sqrt{j} = \sqrt{(j^3)^2 \times j}$
$= \sqrt{j^6 \times j}$
$= \sqrt{j^7}$

j^7 can result in a negative number, so
$j \geq 0$

3. $2k^2\left(\sqrt[3]{4k}\right) = \sqrt[3]{(2k^2)^3 \times 4k}$
$= \sqrt[3]{8k^6 \times 4k}$
$= \sqrt[3]{32k^7}$

You can take the cube root of any real number, so
$k \in \mathbb{R}$

Express each entire radical as a mixed radical in simplest form. Identify any restrictions on the values for the variables.

1. $\sqrt{52} = \sqrt{2^2 \times 13}$
$= 2\sqrt{13}$

2. $\sqrt[4]{m^7} = \sqrt[4]{m^4 \times m^3}$
$= m\sqrt[4]{m^3}$

m^3 can result in a negative number, so
$m \geq 0$

3. $\sqrt{63n^7p^4}$
$= \sqrt{3^2 \times 7 \times n^6 \times n \times p^4}$
$= (3 \times n^3 \times p^2)\sqrt{7 \times n}$
$= 3n^3p^2\sqrt{7n}$

n^7 can result in a negative number, so
$n \geq 0$