

## 2.1-SC Evaluating & Simplifying Trig Expressions

### Skills Check

Directions: All angles are in degrees. Fully simplify all fractions and radicals and rationalize all denominators. If your final answer contains unlike terms that are fractions, give both answers (one as one fraction and one as two fractions). Draw a box around final answers.

1)  $\sec^3 30$

$$\left(\frac{2\sqrt{3}}{3}\right)^3 = \frac{8 \cdot 3\sqrt{3}}{27}$$

$$= \boxed{\frac{8\sqrt{3}}{9}}$$

2)  $(\csc 30 - \tan 60 \cdot \sec 225)^2$

$$(2 - (\sqrt{3})(-\sqrt{2}))^2$$

$$(2 + \sqrt{6})^2$$

$$(2 + \sqrt{6})(2 + \sqrt{6})$$

$$4 + 2\sqrt{6} + 2\sqrt{6} + 6$$

$$\boxed{10 + 4\sqrt{6}}$$

3)  $6(\sin^2 60 - \cos^2 135 - \tan 60)$

$$6\left[\left(\frac{\sqrt{3}}{2}\right)^2 - \left(-\frac{\sqrt{2}}{2}\right)^2 - \sqrt{3}\right]$$

$$6\left(\frac{3}{4} - \frac{2}{4} - \sqrt{3}\right)$$

$$6\left(\frac{1}{4} - \sqrt{3}\right)$$

$$\frac{6}{4} - 6\sqrt{3}$$

$$\boxed{\frac{3}{2} - 6\sqrt{3}}$$

or

$$\boxed{\frac{3 - 12\sqrt{3}}{2}}$$

4)  $(\csc 330)(\cos 315) + \tan 30$

$$(-2)\left(\frac{\sqrt{2}}{2}\right) + \frac{\sqrt{3}}{3}$$

$$\boxed{-\sqrt{2} + \frac{\sqrt{3}}{3}}$$

or

$$\boxed{\frac{-3\sqrt{2} + \sqrt{3}}{3}}$$

5)  $\frac{(\tan 120)(\csc 45)}{(\cos 60)^{-2}}$

$$\frac{(-\sqrt{3})(\sqrt{2})}{\left(\frac{1}{2}\right)^{-2}}$$

$$\left(\frac{1}{2}\right)^{-2} = \left(\frac{2}{1}\right)^2 = 4$$

$$\boxed{\frac{-\sqrt{6}}{4}}$$