Name: ___**Key**___   GTID: _____

Answer the questions in the spaces provided and put your answer in the BOX. Organize work clearly and simplify answers for full credit.

1a. Convert $150°$ to radians.

$$150° * \frac{\pi}{180°} = \frac{150}{180}\pi = \frac{15}{18}\pi$$

$$= \boxed{\frac{5\pi}{6}}$$

$$\boxed{5\pi/6}$$

1b. Find the angle between $0°$ and $360°$ which is coterminal to $780°$.

$$780° - 360° = 420°$$
$$420° - 360° = 60°$$

$$\boxed{60°}$$

1c. Find the exact value of $\cos(\pi) - \sin(\frac{\pi}{2})$.

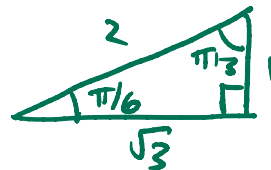$$\cos(\pi) = -1$$
$$\sin(\frac{\pi}{2}) = 1$$

$$-1 - 1 = -2$$

$$\boxed{-2}$$

1d. State the range of $f(x) = 3\csc(2x)$.

range of $y = \csc x$ is $R: (-\infty, -1] \cup [1, \infty)$

same as range $y = \csc(2x)$ (horizontal compression)

So range of $y = 3\csc(2x)$ is $(-\infty, -3] \cup [3, \infty)$

$$\boxed{(-\infty, -3] \cup [3, \infty)}$$

2. Find the six trigonometric values of $\frac{\pi}{6}$.
   Note: clearly label each answer.

$$\sin\left(\pi/6\right) = 1/2 \qquad \csc\left(\pi/6\right) = 2$$

$$\cos\left(\pi/6\right) = \sqrt{3}/2 \qquad \sec\left(\pi/6\right) = 2/\sqrt{3}$$

$$\tan\left(\pi/6\right) = 1/\sqrt{3} \qquad \cot\left(\pi/6\right) = \sqrt{3}$$

3. Find all values of u so that the given point is on the unit circle $(\frac{-1}{3}, u)$. Show work for credit.

$$\left(\frac{-1}{3}\right)^2 + u^2 = 1$$

$$\Rightarrow u^2 = 1 - \frac{1}{9}$$

$$\Rightarrow u^2 = 8/9$$

$$\Rightarrow u = \pm\sqrt{8/9}$$

$$\Rightarrow u = \pm\frac{\sqrt{8}}{3}$$

$$\sqrt{8} = \sqrt{2\cdot 4} = 2\sqrt{2}$$

$$\text{So } \boxed{u = \pm\frac{\sqrt{2}}{3}}$$

4. Graph $f(x) = \sin(2x)$ and include all x-values in the range $[\frac{-\pi}{2}, \pi]$ in your sketch.

   *Note: label any intercepts, label the axes and the curve, and identify and include a total of at least **six** points on your graph for full credit.*