<table>
<tr><td>Trigonometry</td><td>Name:</td></tr>
<tr><td>Study Guide 9</td><td>Class:</td></tr>
<tr><td>Due Date:</td><td>Score:</td></tr>
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No Work ⇔ No Points

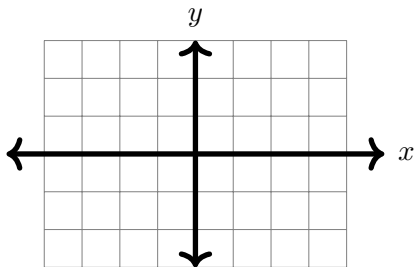**Use Pencil Only ⇔ Be Neat & Organized**

1. **Draw the angle then use the reference angle to find the exact value of the following trigonometric functions:**
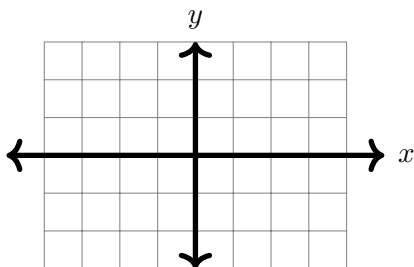
   (a) **(3 points)** $\cos 150°$
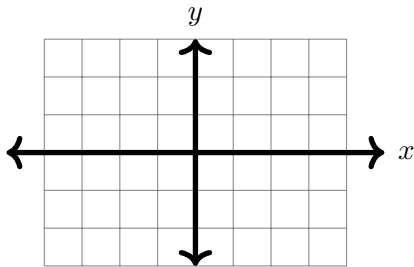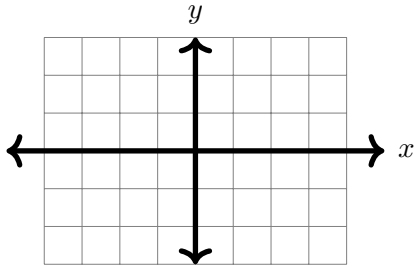

   (a) _____

   (b) **(3 points)** $\csc 210°$

   (b) _____
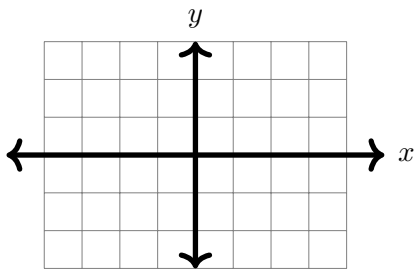
   (c) **(3 points)** $\tan 315°$

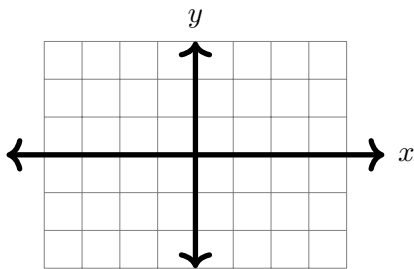   (c) _____

(d) (3 points) $\sin 405°$

y

x

(d) _____

2. **Draw the angle then use the reference angle to evaluate the following trigonometric functions:**

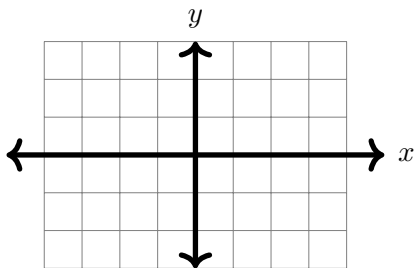**(a) (3 points)** $\sin \dfrac{7\pi}{4}$
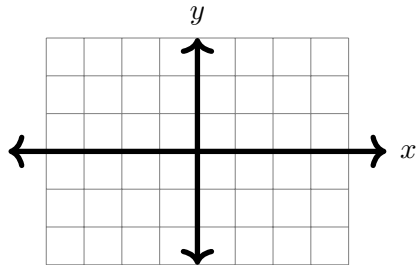
y

x

(a) _____

(b) (3 points) $\cos \dfrac{2\pi}{3}$

y

x

(b) _____

(c) (3 points) $\tan \dfrac{-3\pi}{4}$
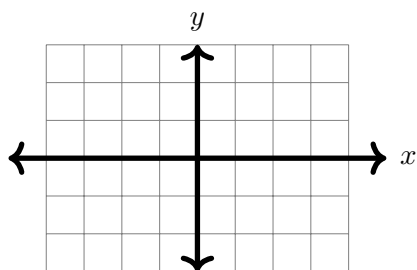
y

x

(c) _____

(d) (3 points) $\cot \dfrac{23\pi}{6}$

(d) _____

(e) (3 points) $\csc \dfrac{13\pi}{2}$

(e) _____

3. **(3 points) Find the exact value of** $\sin 2x$ **given** $\cot x = -\dfrac{1}{4}$ **and** $90° < x < 180°$.

   Hint: $\sin 2x = 2\sin x \cos x$

   3. _____

4. **(3 points) Find the exact value of** $\cos 2x$ **given** $\tan x = \dfrac{3}{4}$ **and** $180° < x < 270°$.

   Hint: $\cos 2x = \cos^2 x - \sin^2 x$

   4. _____

5. **(3 points) Find the exact value of** $\tan 2x$ **given** $\sin x = -\dfrac{5}{13}$ **and** $270° < x < 360°$.

   Hint: $\tan 2x = \dfrac{2\tan x}{1 - \tan^2 x}$

   5. _____

6. **(3 points) Verify:** $\dfrac{\sin(x-y)}{\cos x \cos y} = \tan x - \tan y$

   Hint: $\sin(x-y) = \sin x \cos y - \cos x \sin y$

7. **(3 points) Verify:** $\dfrac{\cos(x+y)}{\sin x \cos y} = \cot x - \tan y$

   Hint: $\cos(x+y) = \cos x \cos y - \sin x \sin y$

8. **(4 points) A ship travels 14 miles on a bearing of $N20°E$, and then it travels on a bearing of $S70°E$ for 20 miles, how far is it from its starting point? Drawing required.**

   8. _____

9. **(4 points) A ship travels 10 miles on a bearing of $350°$, and then it travels on a bearing of $15°$ for 15 miles, how far is it from its starting point? Drawing required.**

   9. _____

Study Guide 9 Total Points: 50