Trigonometry	**Name:** _____
Study Guide 6	**Class:** _____
Due Date: _____	**Score:** _____

No Work $\Leftrightarrow$ No Points

Use Pencil Only $\Leftrightarrow$ Be Neat & Organized

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1. (2 points) Verify by performing cross–multiplication:

$$\frac{\sin x}{1-\cos x} = \frac{1+\cos x}{\sin x}$$

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2. (3 points) Verify by multiplying the numerator and the denominator of the fraction on the left side by the conjugate of the denominator:

$$\frac{\sin x}{1-\cos x} = \frac{1+\cos x}{\sin x}$$

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3. Given: $\sin\alpha = \dfrac{\sqrt{5}}{3}$

(a) (2 points) Find $\csc\alpha$

(a) _____

(b) (2 points) Find $\sin(-\alpha)$

(b) _____

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4. For a circle with radius r, a central angle θ radians subtends an arc of length $s = r\theta$, use this formula to find the arc length for

(a) (2 points) $r = 10$ **in,** $\theta = 0.5$ **radians**

(a) _____

(b) (2 points) $r = 6$ **ft,** $\theta = 30^\circ$

(b) _____

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5. (2 points) Simplify: $\dfrac{\tan x \cdot \cot x}{\sec x \cdot \cos x}$

5. _____

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6. For a circle with radius r, the area A of a circular sector with central angle θ radians is given by $A = \dfrac{1}{2}r^2\theta$, use this formula to find

(a) (3 points) the area of a circular sector with $r = 4$ **in and** $\theta = \dfrac{3\pi}{2}$ **radians.**

(a) _____

(b) (3 points) the area of a circular sector with $r = 24$ **ft and** $\theta = 270^\circ$**.**

(b) _____

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7. (4 points) Given $\tan\alpha = \frac{2}{3}$ and $\pi < \alpha < 3\pi/2$, find the value of all five remaining trigonometric functions of the angle α.

7. _____

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8. Given: $\cos\alpha = \frac{-1}{3}$

(a) (2 points) Find $\sec\alpha$

(a) _____

(b) (2 points) Find $\cos(-\alpha)$

(b) _____

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9. (3 points) Simplify: $\dfrac{1+\tan\alpha}{1+\cot\alpha}$

9. _____

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10. (2 points) Verify: $(1-\cos^2 x)(1+\cot^2 x) = 1$

10. _____

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11. Given $\alpha = 20°$:

(a) (2 points) Find its complement.

(a) _____

(b) (2 points) Find its supplement.

(b) _____

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12. Given $\alpha = \dfrac{\pi}{5}$ radians:

(a) (2 points) Find its complement.

(a) _____

(b) (2 points) Find its supplement.

(b) _____

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13. (3 points) Find the area of the triangle ABC with $a = 7$ ft, $b = 9$ ft, and $c = 12$ by using the Heron's formula.

13. _____

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14. (3 points) Find the area of the triangle ABC with $a = 5$ ft, $b = 12$ ft, and $c = 13$ by using the Heron's formula.

14. _____

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15. (2 points) Given $\tan\alpha = \dfrac{-\sqrt{6}}{3}$, find $\cot(-\alpha)$

15. _____
