Answer each question neatly on the line provided.

Name: ——————————————————————————— ID: ———————————————

1. (5 points) Find the terminal point determined by $t = \frac{13\pi}{6}$.

1. ——————

2. (5 points) Find the reference number of $t = -\frac{41\pi}{4}$.

2. ——————
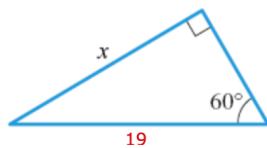
3. (5 points) Evaluate $\cot\left(\frac{5\pi}{6}\right)$.

3. ——————

4. (5 points) Evaluate $\cos t$ if $\sin t = -\frac{4}{5}$ and t is in Quadrant IV.

4. ——————

5. (5 points) Sketch the graph $f(x) = 10\cos(2x)$.

6. (5 points) Use the image to find x.

6. _____

7. (5 points) Solve $e^{3-2x} = 8$ for x.
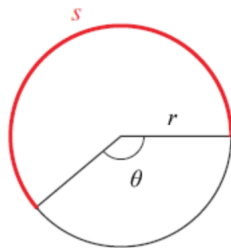
7. _____

8. (5 points) Solve $\ln(2x + 1) = 2$ for x.

8. _____

9. (5 points) Solve $\log_2 x + \log_2(x - 3) = 2$.

9. _____

10. (5 points) Sketch the graph $y = 2 - \sin x$. Label all asymptotes and intercepts on your graph.

11. (5 points) Find the length s of the circular arc   when $r = 8$ and $\theta = 120°$.

11. _____

12. (5 points) A sector of a circle has a central angle of $145°$. Find the area of the sector if if the radius of the circle is 6 cm.

12. _____

13. (5 points) From the top of 220 ft. tall lighthouse, the angle of depression to a ship in the ocean is $25°$. How far is the ship from the base of the lighthouse? You may leave $\sin, \cos$, or $\tan$ in your answer.

13. _____

14. (5 points) Evaluate $\tan 315°$.

14. _____

15. (5 points) Sketch the graph $y = -\tan(x - \frac{\pi}{4})$.

16. (5 points) Evaluate $\sin^{-1}\left(-\frac{\sqrt{2}}{2}\right)$.

16. _____

17. (5 points) Evaluate $\sin\left(\cos^{-1}\left(\frac{1}{2}\right)\right)$.

17. _____

18. (5 points) The $\frac{1}{2}$−life of radium-226 is 1600 years. Suppose we have a 22−miligram sample. How much of the sample will remain after 4000 years?

18. _____

19. (5 points) An initial bacteria count in a culture is 500. After one hour there are 600 bacteria. How long will it take for the bacteria count to double, if the bacteria count grows exponentially.

19. _____

20. (5 points) Find x so that the point $P(x, \frac{1}{3})$ is on the unit circle in Quadrant II.

20. _____