Calculus ABC Test I—Version 8319 **Name:** _____

Lecture section: _____ **Student Number:** _____

PUT ANSWERS IN BOXES. NO BOOKS/NOTES/CALCULATORS. DO YOUR OWN WORK. Simplify answers where possible. Include units where needed. All angles are in radians. $\log = \log_{10}$.

1. Simplify by combining using a common denominator:

$$\frac{x}{x-5} + \frac{x-3}{15-3x}$$

2. Simplify by combining using a common denominator:

$$\frac{1}{z+3} + \frac{1}{z^2-9}$$

3. Solve for x:

$$x^2 = 5$$

4. Solve for y:

$$2y^2 + 7y + 3 = 0$$

5. Solve for y:

$$3y + 11 < 5$$

6. Find the equation of the line between the points $(2, 1)$ and $(1, 6)$ in *point-slope* form.

7. Find all roots of: $x^2 - 3x - 28 = 0$

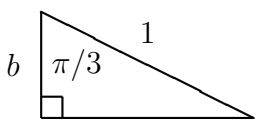
8. Find the value of:

$$\cos\left(\frac{5\pi}{3}\right)$$

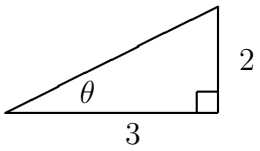
9. Find the value of:

$$\cos\left(\frac{3\pi}{2}\right)$$

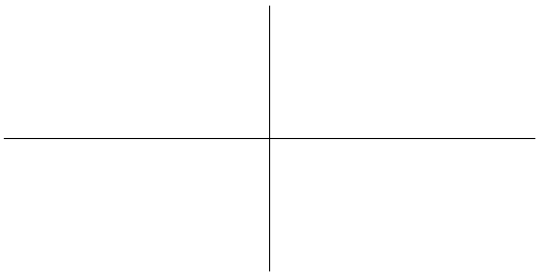
10. Find the value of b:



11. Find the value of $\csc(\theta)$:



12. Graph the function $y = \sin(x)$ for $-\pi \leq x \leq \pi$.
Label with the following values (if applicable): each intercept, location of each asymptote, and (x, y) coordinates of each min and max.



13. Simplify and eliminate any negative exponents:

$$\frac{(x^2y^3)^4(xy^4)^{-3}}{x^2y}$$

14. Simplify:

$$\left(3x^2\right)\left(4x^5\right)$$

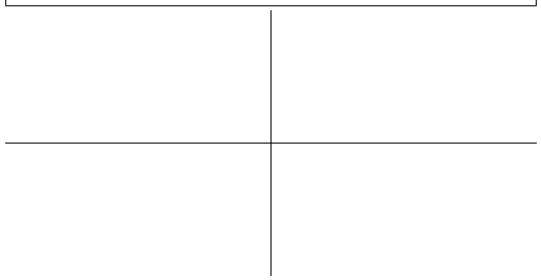
15. Solve for t (write answer as a rational number):

$$100^{3t+2} = 10$$

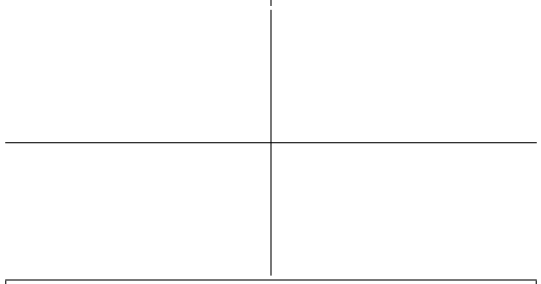
16. Solve for t:

$$10^{3t} = 8$$

17. Graph the equation $x + y = 4$.
Label with the following values (if applicable): each intercept, slope, and (x, y) coordinates of vertex.



18. Graph the function $y = -x^2 + 2$.
Label with the following values (if applicable): each intercept, slope, and (x, y) coordinates of vertex.



19. Find the area of a sector of a circle of radius 3 miles swept by the angle $2\pi/7$ radians.

20. Find the volume of a rectangular box with sides 4 inches, 7 inches, and 7 inches.