Calculus ABC Test I—Version 2023 **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 as far as you can:

$$\frac{x^2 - x - 2}{x^2 - 1}$$

2. Simplify by combining using a common denominator:

$$\frac{x}{x-4} - \frac{3}{x+6}$$

3. Solve for t:

$$\frac{1}{t-2} = 1 + \frac{2}{t^2 - 2t}$$

4. Solve for x:

$$\sqrt{x} - 5 = 7$$

5. Solve for x:

$$\frac{3+x}{3-x} \geq 1$$

6. Find the equation of the line between the points $(0, 1)$ and $(1, 2)$ in *point-slope* form.

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

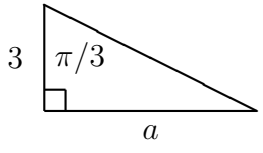
8. Find the value of:

$$\cos(0)$$

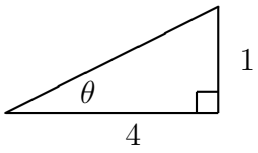
9. Find the value of:

$$\cos\left(\frac{5\pi}{6}\right)$$

10. Find the value of a:



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



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:

$$(-125)^{-1/3}$$

14. Simplify and eliminate any negative exponents:

$$\left(8x^6\right)^{-2/3}$$

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

$$10^{4z+5} = 1000$$

16. Solve for z:

$$7^{z+2} = 3$$

17. Graph the function $y = 5x - 6$.
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 perimeter of a rectangle which has length 7 meters and width 5 meters.

20. Find the volume of a right circular cylinder (a can) with diameter 4 meters and height 6 meters.