Calculus ABC Test I—Version 2345 **Name:** Key

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:

$$1 + \frac{1}{x}$$

$\frac{x+1}{x}$

2. Simplify by combining using a common denominator:

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

$\frac{t^2+3t+12}{(t-4)(t+6)}$

3. Solve for x:

$$x^2 = 6x$$

$x = 0, x = 6$

4. Solve for w:

$$4w^2 = 4w + 3$$

$\left\{-\frac{1}{2}, \frac{3}{2}\right\}$

5. Solve for x:

$$3 - |2x + 4| \leq 1$$

$(-\infty, -3] \cup [-1, \infty)$

6. Find the equation of the line through the point (-1,2) and parallel to the line $x - 2y = 6$ in *slope-intercept* form.

$y = \frac{1}{2}x + \frac{5}{2}$

7. Find all roots of: $s^2 + 3s - 18 = 0$

$\{-6, 3\}$

8. Find the value of:

$$\cos(\pi)$$

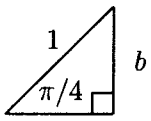
-1

9. Find the value of:

$$\sin\left(\frac{3\pi}{4}\right)$$

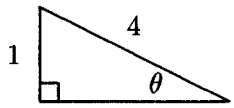
$+\frac{\sqrt{2}}{2}$

10. Find the value of b:



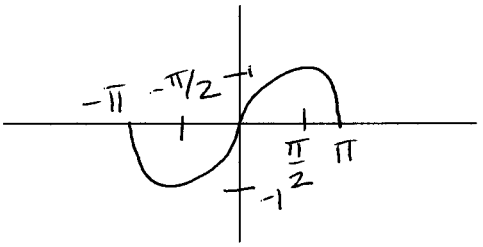
$\frac{\sqrt{2}}{2}$

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



$\frac{4}{\sqrt{15}} = \frac{4\sqrt{15}}{15}$

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:

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

$\frac{1}{x^{4/3}y^2}$

14. Simplify:

$$r^{3/2}r^{5/3}$$

$r^{19/6}$

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

$$32^{3r} = 2$$

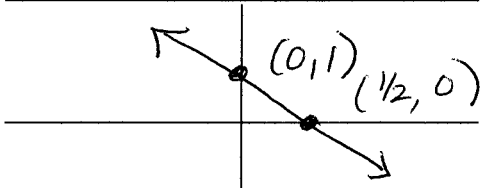
$r = 1/15$

16. Solve for t:

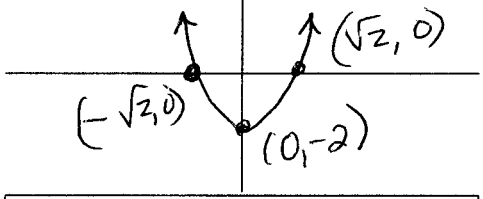
$$3 \cdot 2^t = 10$$

$t = \log_2\left(\frac{10}{3}\right)$

17. Graph the function $y = -2x + 1$.
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 circle which has radius 3 feet.

9π ft^2

20. Find the volume of a sphere of radius 5 feet.

$\frac{500}{3}\pi$ ft^3