Calculus ABC Test I—Version 1854 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:

$$\frac{17x}{8} - \frac{7x}{8} = \frac{10x}{8}$$

$\frac{5x}{4}$

2. Simplify by combining using a common denominator:

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

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

3. Solve for t:

$$5 + \frac{2}{t} = 1 \qquad 5t+2=t, \quad 4t=-2, \quad t=\frac{-2}{4}$$

$t = -1/2$

4. Solve for t:

$$\frac{6}{t-2} = \frac{t^2+t}{t-2} \qquad 6=t^2+t, \quad 0=t^2+t-6, \quad 0=(t-2)(t+3)$$

reject

$t = -3$

5. Solve for x:

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

$[0, 3)$

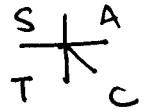
6. Find the equation of the line through the point (1,6) and parallel to the line $x+2y=6$ in *slope-intercept* form.

$y = -\frac{1}{2}x + \frac{13}{2}$

7. Factor: $r^2 + r - 12$

$(r+4)(r-3)$

8. Find the value of:



$$\tan\left(\frac{7\pi}{4}\right)$$

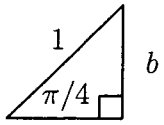
-1

9. Find the value of:

$$\cos\left(\frac{\pi}{4}\right)$$

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

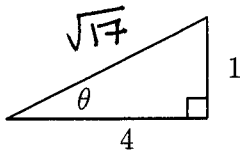
10. Find the value of b:



$\frac{1}{\sqrt{2}} = \frac{\sqrt{2}}{2}$

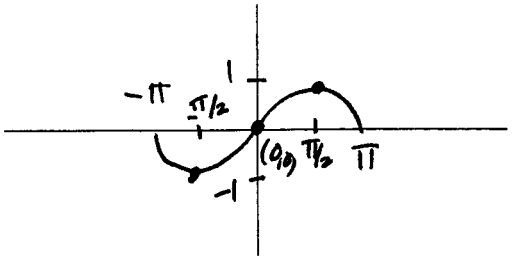
11. Find the value of $\csc(\theta)$:

$\frac{1}{\sin\theta} = \frac{h}{o}$



$\sqrt{17}$

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:

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

$\frac{12}{x^2}$

14. Simplify and eliminate any negative exponents:

$$\frac{y^{-3}z^4}{y^{-5}z^5}$$

$\frac{y^2}{z}$

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

$$8^x = 4$$

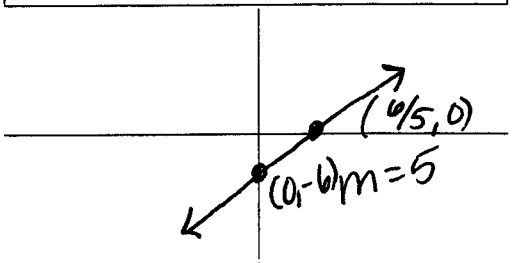
$x = 2/3$

16. Solve for t:

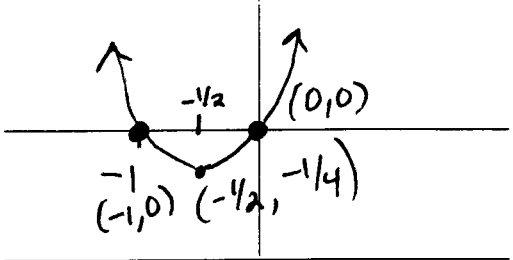
$$3 \cdot 2^t = 10$$

$t = \log_2\left(\frac{10}{3}\right) = \frac{\ln\left(\frac{10}{3}\right)}{\ln 2}$

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 $y = x^2 + x$.
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 cm swept by the angle $\pi/4$ radians.

$\frac{9\pi}{8}$ cm^2

20. Find the volume of a right circular cylinder (a can) with radius 6 cm and height 3 cm.

108π cm^3