Calculus ABC Test I—Version 870 **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 as far as you can:

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

$\frac{(x-1)(x+1)}{(x+2)(x-1)}$

$\frac{x+1}{x+2}$

2. Simplify as far as you can:

$$\frac{x^2-4}{x+2}$$

$\frac{(x-2)(x+2)}{x+2}$

$x-2$

3. Solve for y:

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

$(2y+1)(y+3)=0$

$2y+1=0$ $y=-1/2$ ✓

$y+3=0$ $y=-3$ ✓

$y=\{-3,-1/2\}$

4. Solve for y:

$$\frac{6y-2}{2}=\frac{y+5}{1}$$

$2(y+5)=6y-2$

$2y+10=6y-2$

$12=4y$ $y=3$ ✓

$y=3$

5. Solve for y:

$3y+11<5$

$3y<-6$ $y<-2$

$y<-2$

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

Slope: $\frac{2-1}{1-0}=1$ $y-1=1(x-0)$

$y=x+1$

$y-1=1(x-0)$ or $y-2=1(x-1)$

7. Factor: $4s^2-25$

$(2s-5)(2s+5)$

$(2s-5)(2s+5)$

8. Find the value of:

$$\cos\left(\frac{5\pi}{4}\right)$$

$\frac{5\pi}{4}=225^\circ$ III

$-\cos\pi/4$

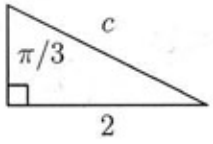
$-\frac{\sqrt{2}}{2}$

9. Find the value of:

$$\sin(\pi)$$

0

10. Find the value of c:



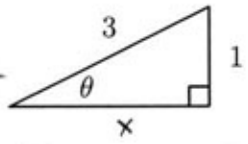
$\sin\pi/3=\frac{2}{c}$

$\frac{\sqrt{3}}{2}=\frac{2}{c}$ $c=\frac{4}{\sqrt{3}}$

$\frac{4}{\sqrt{3}}$

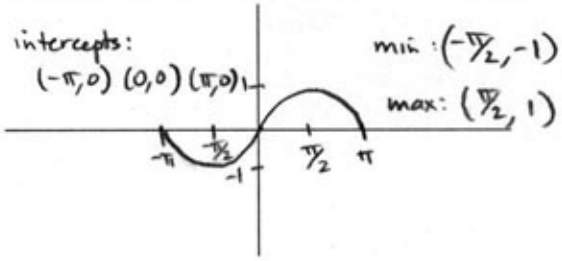
11. Find the value of $\tan(\theta)$:

$x^2+1=9$, $x^2=8$, $x=2\sqrt{2}$, $\tan\theta = \frac{1}{2\sqrt{2}}$



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

12. Graph the function $y = \sin(x)$ for $-\pi \le x \le \pi$.
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:

$$a^9a^{-5} \qquad a^4$$

a^4

14. Simplify and eliminate any negative exponents:

$$\left(x^{2/5}\right)^{-3/4} \qquad x^{\left(\frac{2}{5}\right)\left(\frac{-3}{4}\right)} \qquad x^{-3/10}$$

$\frac{1}{x^{3/10}}$

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

$$3^{4y+1} = 27 \qquad 3^{4y+1} = 3^3$$

$4y+1=3$, $4y=2$, $y=\frac{1}{2}$

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

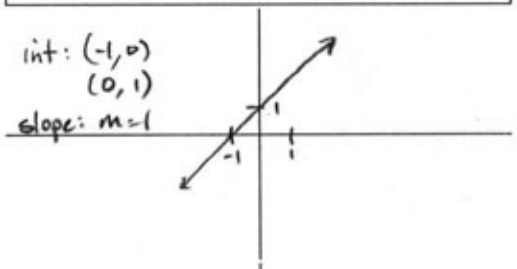
16. Solve for t:

$\log 5^{-t/1000} = \log 2$ $\quad 5^{-t/1000} = 2$

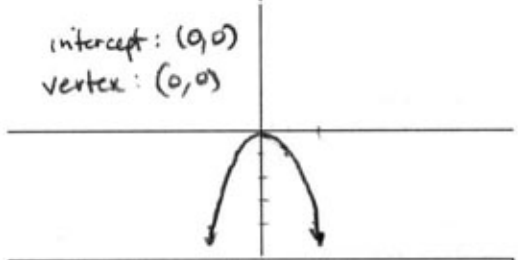
$\frac{-t}{1000}\log 5 = \log 2$ $\quad t = \frac{-1000\log 2}{\log 5}$

$t = \frac{-1000\log 2}{\log 5}$

17. Graph the function $y = x + 1$.
Label with the following values (if applicable): each intercept, slope, and (x, y) coordinates of ~~vertex~~.



18. Graph the function $y = -x^2$.
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 6 inches and width 3 inches.

$P = 2l + 2w$

$P = 2(6)+2(3) = 18$

18 in

20. Find the volume of a rectangular box with sides 2 cm, 3 cm, and 5 cm.

$V = lwh = (2)(3)(5)$

$30\ \text{cm}^3$