Calculus ABC Test II—Version 2379

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. Find the equation of the line through the point (1,7) with slope 1 in *slope-intercept* form.

$\boxed{y = x + 6}$

2. Find the value of:

$$\arctan(-1)$$

$\boxed{-\pi/4}$

3. Solve for x:

$$\frac{x-2}{5} = \frac{x+4}{20}$$

$\boxed{x = 4}$

4. Rewrite by completing the square: $3r^2 - 6r - 1$

$\boxed{3(r-1)^2 - 4}$

5. Find the value of:

$$\arccos(-1)$$

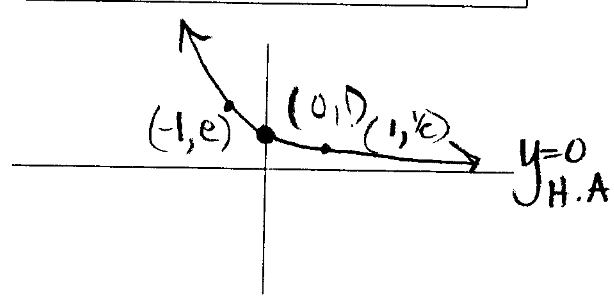
$\boxed{\pi}$

6. Solve for t:

$$e^{3t} - a^3 = 0$$

$\boxed{t = \ln a}$

7. Graph the function $y = e^{-x}$.
Label with the following values (if applicable): each intercept, location of each asymptote, and (x, y) coordinates of each min and max. Also include the coordinates of one other point.



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

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

$\boxed{t = -1/2}$

9. If $f(s) = 5s^3 - 2s^2 - 7s + 9$, find $f'(s)$.

$\boxed{15s^2 - 4s - 7}$

10. If $g(\theta) = \cos(\theta)$, find $g'(\theta)$.

$-\sin\theta$

11. If $y = \tan^5(\theta)$, find $dy/d\theta$.

$5\tan^4\theta \cdot \sec^2\theta$

12. If $z = \tan^3(t)$, find dz/dt.

$3\tan^2 t \cdot \sec^2 t$

13. Find the derivative of

$$f(x) = 4e^x \cos(x)$$

$4e^x\cos x - 4e^x \sin x$
$= 4e^x(\cos x - \sin x)$

14. Find the derivative of

$$f(x) = \frac{1+x}{\sqrt{x}}$$

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

15. Find the derivative of

$$f(x) = \frac{\ln(x)}{x+1}$$

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

16. Find a function $f(t)$ whose derivative is:

$$f'(t) = \sqrt{t} + \frac{2}{t}$$

$\frac{2}{3}t^{3/2} + 2\ln t + C$

17. Evaluate the indefinite integral:

$$\int (2-x)^4\, dx$$

$-\frac{1}{5}(2-x)^5 + C$

18. Evaluate the indefinite integral:

$$\int e^t \sin(e^t)\, dt$$

$-\cos(e^t) + C$

19. Evaluate the definite integral:

$$\int_0^2 (6x^2 - x)\, dx$$

14

20. Evaluate the definite integral:

$$\int_1^2 e^{-x}\, dx$$

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

$= \frac{e-1}{e^2}$