Calculus ABC Test II—Version 478 **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 between the points $(2, 1)$ and $(1, 6)$ in *slope-intercept* form.

$m = \frac{6-1}{1-2} = \frac{5}{-1} = -5$ $\quad y-1 = -5(x-2)$ $\quad y-1 = -5x+10$ $\quad y = -5x+11$

$y = -5x + 11$ ✓

2. Find the value of:

$$\arcsin\left(\frac{1}{2}\right)$$

$\frac{\pi}{6}$ ✓

3. Solve for x:

$x+2 = 5(x-3)$ $\quad \frac{x+2}{x-3} = 5$

$x+2 = 5x-15$

$17 = 4x$

$\frac{17}{4}$ ✓

4. Rewrite by completing the square: $w^2 + 4w$

$(w+2)^2 = w^2+4w+4$

$(w+2)^2 - 4$ ✓

5. Find the value of:

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

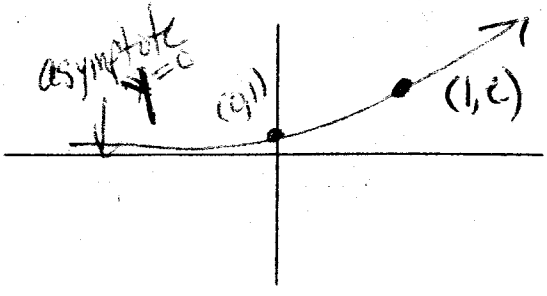
-1 ✓

6. Simplify as far as you can:

$$\ln\left(\frac{e}{\pi}\right) + \ln\left(e^2\pi\right)$$

~~2~~ 3 OK ✓

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 y:

$$\log(y^2 - y - 2) = 1$$

$y=4, \; y=-3$ ✓

9. If $f(x) = 5x^3 + 7x^2 - 6x + 1$, find $f'(x)$.

$15x^2+14x-6$ ✓

10. If $g(t) = \ln(t)$, find $g'(t)$.

$\frac{1}{t}$ ✓

11. If $h(t) = 5\sin(e^t)$, find $h'(t)$.

$5\cos(e^t)\cdot e^t$ ✓

12. If $g(\theta) = \tan(\theta^2 + \theta)$, find $g'(\theta)$.

$\sec^2(\theta^2+\theta)\cdot(2\theta+1)$ ✓

13. Find the derivative of

$$f(\theta) = (\theta^2 + 3)\tan(\theta)$$

$(\theta^2+3)\sec^2\theta + 2\theta\cdot\tan\theta$ ✓

14. Find the derivative of

$$h(t) = \frac{t+1}{t}$$

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

15. Find the derivative of

$$h(t) = \frac{\sin(t)}{t+1}$$

$\frac{(t+1)\cdot\cos(t) - \sin(t)(1)}{(t+1)^2}$ ✓

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

$$f'(t) = 3e^t + \sin(t)$$

$3e^t - \cos(t)$ ✓

17. Evaluate the indefinite integral:

$u = 2-x$, $du = -dx$, $-\int u^4\,du$, $-\frac{(2-x)^5}{5}$

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

$-\frac{(2-x)^5}{5}+C$ ✓

18. Evaluate the indefinite integral:

$u = x^4-2$, $u = 4x^3dx$, $\int \cos u\,\frac{du}{4}$, $\frac{du}{4} = x^3dx$

$$\int x^3\cos(x^4-2)\,dx$$

$\frac{1}{4}\cdot\sin(x^4-2)+C$ ✓

19. Evaluate the definite integral:

$\frac{x^4}{4}\Big]_0^1 = \frac{1}{4}-0$

$$\int_0^1 x^3\,dx$$

$\frac{1}{4}$ ✓

20. Evaluate the definite integral:

$\frac{4}{9}x^{\frac{9}{4}}\Big]_0^1$

$$\int_0^1 x^{5/4}\,dx$$

$\frac{4}{9}$ ✓