Calculus ABC Test II—Version 2391 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 (0,0) and parallel to the line $-x + 2y = 6$ in *slope-intercept* form.

$y = \frac{1}{2}x + 0$

2. Find the value of:

$$\arcsin\left(-\frac{\sqrt{3}}{2}\right)$$

$-\frac{\pi}{3}$

3. Solve for θ:

$$\theta^2 = 16$$

$\theta = \pm 4$

4. Rewrite by completing the square: $3 - 2x + x^2$

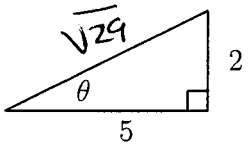
$(x^2 - 2x) + 3$

$(x^2 - 2x + 1) - 1 + 3$

$(x-1)^2 + 2$

5. Find the value of $\sin(\theta)$:

$25 + 4 = x^2$



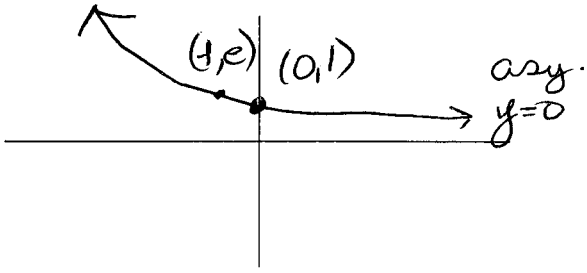
$\frac{2}{\sqrt{29}} = \frac{2\sqrt{29}}{29}$

6. Simplify as far as you can:

$$\ln(e^4)$$

4

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. Simplify:

$$z^{2/3} z^{1/5}$$

$\frac{2}{3} + \frac{1}{5}$

$10 + 3$

$z^{13/15}$

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

$21x^2 + 12x + 2$

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

$\sec^2(\theta)$

11. If $y = \sqrt{\sin(x)}$, find dy/dx.

$\frac{1}{2}(\sin(x))^{-1/2}\cos x$

12. If $f(x) = \cos(x - x^2)$, find $f'(x)$.

$-\sin(x-x^2)(1-2x)$

13. Find the derivative of

$$h(t) = t^2 \ln(t)$$

$2t\ln t + t$

14. Find the derivative of

$$g(x) = \frac{\cos(x)}{x^2}$$

$\frac{(-\sin x)x^2 - (\cos x)2x}{x^4}$

15. Find the derivative of

$$g(x) = \frac{e^x - 1}{e^x + 1}$$

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

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

$$f'(x) = 3e^x + 2$$

$3e^x + 2x + C$

17. Evaluate the indefinite integral:

$$\int \sin(6\theta - 2)\, d\theta$$

$-\frac{1}{6}\cos(6\theta-2)+C$

18. Evaluate the indefinite integral:

$$\int te^{t^2+1}\, dt$$

$\frac{1}{2}e^{t^2+1}+C$

19. Evaluate the definite integral:

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

$1/4$

20. Evaluate the definite integral:

$$\int_4^9 \frac{1}{\sqrt{t}}\, dt$$

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