Calculus ABC Test II—Version 615 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 $(1, -2)$ and $(4, 6)$ in *point-slope* form.

$y + 2 = \frac{8}{3}(x - 1)$

2. Find the value of:

$$\arccos\left(\frac{\sqrt{2}}{2}\right)$$

$\frac{\pi}{4}$

3. Solve for x:

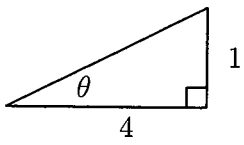
$$x^2 + 5x = 24$$

$x = 8, x = 3$

4. Rewrite by completing the square: $3t^2 - 12t + 6$

$3(t-2)^2 - 6$

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



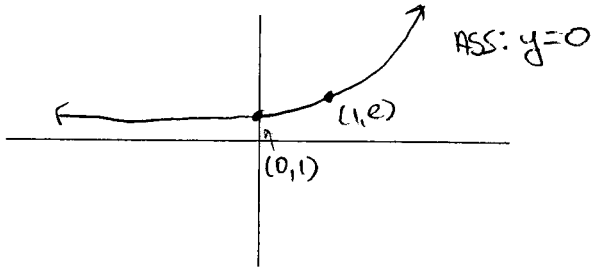
$\frac{1}{\sqrt{17}}$ or $\frac{\sqrt{17}}{17}$

6. Solve for r:

$$e^{5r^2} - 2 = 0$$

$\pm\sqrt{\frac{\ln 2}{5}}$

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:

$$\left(x^2\right)^3$$

x^6

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

$30x^4 + 6x^2 - 7$

10. If $g(t) = \dfrac{1}{t}$, find $g'(t)$.

$-\dfrac{1}{t^2}$

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

$5\cos(e^t) \cdot e^t$

12. If $f(\theta) = e^{\cos(\theta)}$, find $f'(\theta)$.

$-e^{\cos\theta} \cdot \sin\theta$

13. Find the derivative of

$$h(\theta) = \theta^3 \tan(\theta)$$

$\theta^3 \sec^2\theta + \tan\theta \cdot 3\theta^2$

14. Find the derivative of

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

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

15. Find the derivative of

$$h(x) = \frac{\cos(x)}{1-x}$$

$\dfrac{(1-x)\cos x + \sin x(1-x)}{(1-x)^2}$

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

$$f'(x) = 5\cos(x) + x^{3/2}$$

$5\sin(x) + \frac{2}{5}x^{5/2}$

17. Evaluate the indefinite integral:

$$\int (3-2x)^{10}\,dx$$

$10(3-2x)^9$

18. Evaluate the indefinite integral:

$$\int x\sin(x^2+1)\,dx$$

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

19. Evaluate the definite integral:

$$\int_{-1}^{2} (2x^2+1)\,dx$$

$\frac{27}{5}$

20. Evaluate the definite integral:

$$\int_0^5 \sqrt{y}\,dy$$

$\frac{2}{3}\sqrt{125}$