Name:_____

Honors Calculus Summer Packet

Due: First day of school. Must show all work on a separate piece of paper.

Factor.

1. $8x^3 + 125$	2. $250x^4 + 128x$	3. $x^3 - 216y^3$
4. $35xy - 5x - 56y + 8$	5. $5x^3 - 10x^2 - 3x + 6$	6. $15x^2 - 27x - 6$
7. $7x^2 - 44x + 12$	8. $6x^2 - 30x - 300$	9. $36x^2 - 49y^2$

Solve.

10. $2x^2 + 6x = -9$

Apply the remainder theorem to evaluate.

11. $f(x) = x^5 - 47x^3 - 16x^2 + 8x + 52$ at $x = 7$	12. $f(x) = x^4 - 3x^3 - 17x^2 + 2x - 7$ at $x = 3$

Divide using long division.

13. $2x^4 + x^2 - 3x + 7 \div x + 2$	14. $3x^6 + 2x + 5 \div x - 1$

Simplify.

15. $\frac{5}{n+5} + \frac{4n}{2n+6}$	16. $\frac{\frac{25}{4}}{\frac{1}{5} - \frac{4}{25}}$
17. $\frac{5-x}{x^2-25}$	18. $\left(4a^{\frac{5}{3}}\right)^{\frac{3}{2}}$
19. Let $f(x) = 2x + 1$ and $g(x) = 2x^2 - 1$. Find $g(f(m + 2))$.	20. Find the domain of each function. a) $f(x) = x^2 - 6x$ b) $f(x) = \sin x$ c) $f(x) = \frac{1}{5-x}$ d) $f(x) = \sqrt{4 - x}$ e) $f(x) = \frac{x}{x^2+3x+2}$

Simplify using the GCF.

21. $3x^2(2x^3 + 2)^{-3} - 6x(2x^3 + 2)^{-4}$	22. $-6\pi x^2(2x^2 - 1)^{-3/2} + 3\pi(2x^2 - 1)^{-1/2}$

Solve for x on the interval from $[0, 2\pi]$

23. $sinx + 2 = 3$	24. $\cos x + \sqrt{3} = -\cos x$
25. $4\sin^2\theta - 3 = 0$	26. $2\sin^2 x - 3\sin x + 1 = 0$

Verify the following trig identities.

27. $\dfrac{\tan^2 x}{\tan^2 x + 1} = \sin^2 x$	28. $\sin^4 x - \cos^4 x = 1 - 2\cos^2 x$
29. $(sec^2 x - 1)cos^2 x = sin^2 x$	30. $\sin\theta - \sin\theta\cos^2\theta = \sin^3\theta$

Must know!

Reciprocal Identities

$$\csc(\theta) = \frac{1}{\sin(\theta)} \qquad \sin(\theta) = \frac{1}{\csc(\theta)}$$

$$\sec(\theta) = \frac{1}{\cos(\theta)} \qquad \cos(\theta) = \frac{1}{\sec(\theta)}$$

$$\cot(\theta) = \frac{1}{\tan(\theta)} \qquad \tan(\theta) = \frac{1}{\cot(\theta)}$$

Unit Circle Table

Degrees	Radians	Coordinates	sin( )	cos ( )	tan ( )	csc ( )	sec ( )	cot ( )
0°								