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NAME

Honors Calculus Summer Packet Mr. Joyce  
Due Date: First Day of School

Solve all problems on separate sheets of paper. Make sure you number each problem on your work sheet. Write neatly and show all work that you did to arrive at a solution.

### FACTORING CUBES

1.  $8x^3 + 125$

2.  $250x^4 + 128x$

3.  $x^3 - 216y^3$

### FACTOR BY GROUPING

4.  $35xy - 5x - 56y + 8$

5.  $5x^3 - 10x^2 - 3x + 6$

### FACTORING THE QUADRATIC FORM

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

7.  $7x^2 - 44x + 12$

8.  $6x^2 - 30x - 300$

### THE REMAINDER THEOREM

Evaluate each function at the given value.

9.  $f(x) = x^5 - 47x^3 - 16x^2 + 8x + 52$  at  $x = 7$

10.  $f(x) = x^4 - 3x^3 - 17x^2 + 2x - 7$  at  $x = 3$

### DIVIDING BY LONG DIVISION

11.  $2x^4 + x^2 - 3x + 7 \div (x + 2)$

12.  $3x^6 + 2x + 5 \div (x - 1)$

### DIVIDE BY USING SYNTHETIC DIVISION

13.  $x^3 - 2x^2 - x + 2 \div (x - 2)$

14.  $x^4 - 2x^3 - 35x^2 - 23x + 180 \div (x + 6)$

### DIVIDING FRACTIONS

Simplify

15.  $\frac{\frac{3}{15}}{\frac{24}{35}} =$

16.  $\frac{\frac{6}{x^2}}{\frac{x}{3}} =$

17.  $\frac{\frac{(x+y)}{5}}{\frac{(x^2 + 2xy + y^2)}{10}} =$

18.  $\frac{5}{28x+4} \div \frac{4}{35x+5} =$

### FACTORING THE LOWEST VARIABLE OR POWER SIMPLIFY

19.  $3x^2(2x^3 + 2)^{-3} - 6x(2x^3 + 2)^{-4}$

20.  $-6\pi x^2(2x^2 - 1)^{-\frac{3}{2}} + 3\pi(2x^2 - 1)^{-\frac{1}{2}}$

**RATIONALIZING A FUNCTION  
SIMPLIFY**

21.  $\frac{-3-\sqrt{2}}{3\sqrt{17}}$

22.  $\frac{-4+\sqrt{3}}{5+\sqrt{2}}$

23.  $\frac{\sqrt{x}}{x-\sqrt{x}}$

**UNIT CIRCLE VALUES  
evaluate**

$\sin 0 =$

$\cos 0 =$

$\tan 0 =$

$\sin \frac{\pi}{2} =$

$\cos \frac{\pi}{2} =$

$\tan \frac{\pi}{2} =$

24.  $\sin \pi =$

25.  $\cos \pi =$

26.  $\tan \pi =$

$\sin \frac{3\pi}{2} =$

$\cos \frac{3\pi}{2} =$

$\tan \frac{3\pi}{2} =$