**Name** _____ **DUE DATE:** _____

***Directions:***

- *Read each problem carefully and use your knowledge of mathematics to determine your answer.*
- *In order to receive FULL CREDIT you must either SHOW ALL WORK or EXPLAIN how you got your answer!! PLEASE NOTE: A multiple choice answer alone without any work will only receive half credit.*

| Question | Your Work/Explanation |
|---|---|
| 1) Simplify: $\sqrt{75x^2y^{-4}}$<br><br>(a) $\frac{5\sqrt{3}x}{y^2}$ (b) $\frac{3\sqrt{5}x}{y^2}$<br><br>(c) $5\sqrt{3}xy^2$ (d) $3\sqrt{5}xy^2$ | |
| 2) Find $\lim_{x\to 2}\frac{x^3-8}{x^2-4}$<br><br>(a) 0 (b) 1 (c) 3 (d) $\infty$ | |
| 3) Simplify by rationalizing the denominator: $\frac{15}{5+2\sqrt{5}}$ | |

| | |
|---|---|
| 4) Simplify: $\left(3x^{1/4}y^{-2}\right)\left(-4x^{1/3}y^{1/5}\right)$ | |
| 5) Factor: $9x(3x-5)^2+(3x-5)^3$<br><br>(a) $(3x-5)^3(9x+1)$<br>(b) $(3x-5)^2(6x-5)$<br>(c) $(3x-5)^2(12x-5)$<br>(d) $(3x-5)(30x^2-70)$ | |
| 6) Convert from rectangular to polar coordinates: $\left(5\sqrt{2}\,,-5\sqrt{2}\right)$ | |
| 7) Find the sum: $\sum_{k=2}^{6}(-1)^k(2k)$<br><br>(a) 40 (b) $-4$ (c) 6 (d) 8 | |

8) Divide: $\frac{x+y}{x^3-x^2} \div \frac{x^2+y^2}{x^2-x}$

(a) $\frac{1}{x(x+y)}$ (b) $\frac{x+y}{x(x^2+y^2)}$

(c) $\frac{x(x^2+y^2)}{x+y}$ (d) $-x$

9) Find $\lim_{x\to\infty} \frac{5x^3+27}{20x^2+10x+9}$

(a) $\frac{1}{4}$ (b) 0 (c) 5 (d) $\infty$

10) Solve: $(x-1)^2 = 3x+5$

(a) $1, 4$ (b) $\frac{5\pm\sqrt{39}}{2}$

(c) $\frac{5\pm\sqrt{41}}{2}$ (d) $-1, 6$

11) Simplify: $\dfrac{\frac{1}{x} - \frac{1}{x+1}}{\frac{1}{x^2+2x+1}}$

12) Find all solutions in the interval $[0,2\pi)$:

$$2sin^3x + sin^2x = 0$$