

RIDDLE  
PRE-CALCULUS  
MIDTERM EXAM PRACTICE

NAME \_\_\_\_\_

WRITE THE EQUATION IN STANDARD FORM FOR THE FOLLOWING CONIC SECTIONS:

1. A circle with center (2, -5) and radius 2.
2. An ellipse with semi-major axis 5 units and foci at (3, 1) and (3, -5).
3. A hyperbola with foci (2, 5) and (-4, 5) and transverse axis = 4.
4. A parabola with vertex at the origin and focus (-3, 0).

SOLVE.

- |                                       |  |
|---------------------------------------|--|
| 5. $\log_x \sqrt[3]{8} = \frac{1}{3}$ | 6. $\log_2 0.25 = x$                             |
| 7. $\log_5 (2x) = \log_5 (3x - 4)$    | 8. $\frac{1}{2} \log_3 64 - \log_3 x = \log_3 4$ |
| 9. $2^{2x} = 64$                      | 10. $3.6^x = 72.4$                               |
| 11. $4^{x+3} = 25.8$                  | 12. $6^{x-1} = 8^{2-x}$                          |
| 13. $400 = 2e^{0.032t}$               | 14. $4500 = e^{0.061t}$                          |
| 15. $\ln 6.2 = \ln e^{0.21t}$         | 16. $\ln 19.8 = \ln e^{0.083t}$                  |

FIND THE SUM OF THE INFINITE SERIES OR STATE THAT IT DOES NOT EXIST.

- |   |  |
|---|--|
| 17. $\frac{1}{15} + \frac{1}{150} + \frac{1}{1500} + \dots$ | 18. $\frac{2}{7} + \frac{4}{7} + \frac{8}{7} + \dots$              |
| 19. $10 + 5 + 2.5 + \dots$                                  | 20. Write the repeating decimal as a REDUCED fraction. 0.123123... |

EVALUATE EACH LIMIT OR STATE THAT THE LIMIT DOES NOT EXIST.

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|---|--|
| 1. $\lim_{n \rightarrow \infty} \frac{4n^2 - 5n}{3n^2 + 4}$ | 2. $\lim_{n \rightarrow \infty} \frac{5n^3 + 1}{3n^2 + 1}$ |
| 3. $\lim_{n \rightarrow \infty} \frac{n^2 - 9}{n^3 + 27}$   | 4. $\lim_{n \rightarrow 4} \frac{n - 4}{\sqrt{n} - 2}$     |
| 5. $\lim_{x \rightarrow 3} x^2 + 3x - 8$                    | 6. $\lim_{x \rightarrow 2} \frac{x - 2}{x^2 - 4}$          |
| 7. $\lim_{x \rightarrow 2} \frac{x^2 - 5x + 6}{x - 2}$      | 8. $\lim_{x \rightarrow 2} \sqrt{x^2 - 2x + 1}$            |

**GRAPH. FIND ANY ASYMPTOTES OR HOLES. DESCRIBE THE DOMAIN, RANGE, CONTINUITY, ROOTS, AND END BEHAVIOR.**

1.  $f(x) = \begin{cases} x^2, & x > 2 \\ x - 1, & x \leq 2 \end{cases}$

2.  $f(x) = -3(x + 3)^2 - 3$

3.  $f(x) = \frac{1}{x + 2}$

4.  $y = \log_2(x + 1) - 3$

**GRAPH.**

5.  $y = \frac{x^2 - 3x + 2}{x}$

**GRAPH. PROVIDE ALL FACTS, INCLUDING ECCENTRICITY.**

6.  $(x + 2)^2 + (y - 1)^2 = 9$

7.  $4x^2 + 9y^2 - 8x - 36y + 4 = 0$

8.  $\frac{(x - 3)^2}{4} - \frac{(y + 1)^2}{25} = 1$

9.  $y - 2 = \frac{1}{8}(x - 1)^2$

10. Graphical Limits