MTH 28, Midterm 1, V. 1, 04/10/25 Prof. Luis Fernández

NAME:_____

There are 18 questions. Some are multiple choice and some are free response.
Each question is worth 6 points over 100 for a total of 108 (so 8 points are extra credit).
For multiple-choice questions, just circle your answer.
For free-response questions, SHOW ALL WORK to receive credit.

1. Factor out the greatest common factor (GCF).
$6x^4 - 9x^3$

2. Factor by grouping:
$y^2 - 7y + 4y - 28$

3. Factor out the greatest common factor (GCF).
$25x^2y^4 + 10xy - 15x$

4. Factor:
$x^2 - x - 6$

5. Factor:

$x^2 + 8x + 15$

6. Factor:

$8x^2 - 2x - 1$

7. Factor the difference of squares:

$4x^2 - 9$

8. Factor completely: $45x^2y - 20y^3$

Circle the answer.

(a) $5\left(9x^2y - 4y^3\right)$

(b) $5y\left(9x^2 - 1024y^2\right)$

(c) $5y(3x - 2y)^2$

(d) $5y(3x - 2y)(3x + 2y)$

9. Factor completely: $30x^2y + 5xy - 60y$

Circle the answer.

(a) $5y(3x - 4)(2x + 3)$

(b) $xy(15x + 65)$

(c) $y\big(30x^2 + 5x - 60\big)$

(d) $5y\big(6x^2 + x - 12\big)$

10. Solve the equation
$n^2 + 8n + 7 = 0.$

11. Solve the equation
$7z - z^2 = 0.$

12. Given the function $f(x) = 3x^2 + 5x - 2$, calculate the following values:

- $f(0) =$ _____
- $f(2) =$ _____
- $f(-2) =$ _____
- $f(x + 1) =$ _____
- $f(-x) =$ _____

13. For the polynomial $x^2 + x^5 - 3x - 5$,

a) Determine the coefficient and the degree of each term.

Term	Coefficient	Degree
x^2		
x^5		
$-3x$		
-5		

b)
The degree of the polynomial is ____,

The leading term is ____ ,

The leading coefficient is ____ .

14. Find all real number solutions for the equation

$$x(x - 18) = -72.$$

15. Solve the equation: $6x^2 + 3 = 11x$.

16. Evaluate the function $g(x) = -4$ at the given values:

- $g(0) =$ _____
- $g(2) =$ _____
- $g(-5) =$ _____
- $g(x + 1) =$ _____

17. Solve the equation

$$3w^3 - 27w^2 + 54w = 0.$$

18. Let $f(x) = \dfrac{x+7}{3x-3}$.

Compute the following values.
If one is not defined, type *Undefined.*

- $f(0) =$ _____
- $f(2) =$ _____
- $f(1) =$ _____