

MTH 28, Midterm 1, V. 3, 09/25/24

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:

$$8x^2 - 2x - 1$$

2. Factor the difference of squares:

$$4x^2 - 9$$

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

Circle the answer.

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

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

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

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

4. Factor:

$$x^2 - x - 6$$

5. Factor:

$$x^2 + 8x + 15$$

6. Factor out the greatest common factor (GCF).

$$6x^4 - 9x^3$$

7. Factor by grouping:

$$y^2 - 7y + 4y - 28$$

8. Factor out the greatest common factor (GCF).

$$25x^2y^4 + 10xy - 15x$$

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

Circle the answer.

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

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

(c) $5y(6x^2 + x - 12)$

(d) $y(30x^2 + 5x - 60)$

10. 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 _____ .

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

• $f(0) =$ _____

• $f(2) =$ _____

• $f(-2) =$ _____

• $f(x + 1) =$ _____

• $f(-x) =$ _____

12. Solve the equation

$$7z - z^2 = 0.$$

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

14. Find all real number solutions for the equation

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

15. Let $f(x) = \frac{x + 7}{3x - 3}$.

Compute the following values.

If one is not defined, type *Undefined*.

• $f(0) =$ _____

• $f(2) =$ _____

• $f(1) =$ _____

16. Solve the equation

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

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

• $g(0) =$ _____

• $g(2) =$ _____

• $g(-5) =$ _____

• $g(x + 1) =$ _____

18. Solve the equation

$$n^2 + 8n + 7 = 0.$$

