

MTH 06, Test 3, V. 3, 11/09/21

Prof. Luis Fernández

NAME: _____

There are 22 questions. Some are multiple choice and some are free response.
Each question is worth 5 points over 100 (so 10 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. Simplify the rational expression.

$$\frac{x^2 - 2x - 8}{x - 4}$$

11. Multiply and simplify your answer.

$$\frac{x^2 - 4}{x^2 - 3x + 2} \cdot \frac{x - 1}{x}$$

12. Solve the equation

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

13. Divide and simplify your answer.

$$\frac{x^2 - 25}{x^2 - 11x + 30} \div \frac{x}{x - 6}$$

14. Divide and simplify your answer.

$$\frac{x^2 + 7x}{10} \div \frac{x + 7}{2}$$

15. Simplify the expression

$$\frac{1 + \frac{4}{c - 4}}{1 - \frac{4}{c - 4}}$$

16. Subtract and simplify

$$\frac{7}{x + 5} - \frac{2x}{x^2 - 25}$$

17. Subtract and simplify

$$\frac{2x}{x^2 + 3x - 4} - \frac{1}{x - 1}$$

18. Add and simplify

$$\frac{5}{y - 3} + \frac{3}{y + 5}$$

19. Add and simplify.

$$\frac{5}{7x^2} + \frac{3}{x}$$

20. Solve the equation

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

21. Solve the equation: $\frac{x}{4x-12} - \frac{x-4}{x-3} = 1$.

22. Solve the following equation:
$$\frac{4}{x^2-25} + \frac{3}{x-5} = \frac{2}{x+5}$$