

MTH 05, Test 3, V. 3, 11/21/17

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NAME: _____

There are twenty-two questions, each worth 5 points. For multiple-choice questions, circle your answer. For free-response questions, SHOW ALL WORK to receive full credit.

1. Divide and write in scientific notation:

$$\frac{3.6 \times 10^{13}}{4 \times 10^7}$$

- (a) 9×10^6
- (b) 0.9×10^6
- (c) 9×10^7
- (d) 9×10^5

2. Multiply: $(4x - 5)(x^2 - 3x + 2)$

- (a) $4x^3 - 12x^2 + 23x - 10$
- (b) $4x^3 - 12x^2 - 7x - 10$
- (c) $4x^3 - 17x^2 - 7x - 10$
- (d) $4x^3 - 17x^2 + 23x - 10$

3. Write using only positive exponents:

$$(-x^3y^{-6}z^5)(8x^{-3}yz^4)$$

- (a) $-\frac{8z^{20}}{x^9y^6}$
- (b) $-\frac{8z^9}{y^5}$
- (c) $\frac{z^9}{8y^5}$
- (d) $\frac{24x^6z^9}{y^5}$

4. Which of the following is a factor of the polynomial: $x^2 + 11x + 30$?

- (a) $(x + 6)$
- (b) $(x - 6)$
- (c) $(x + 11)$
- (d) $(x - 5)$

5. Which of the following is a factor of the polynomial: $2cx - 5cy - 6dx + 15dy$?

- (a) $2x + 5y$
- (b) $x - 3y$
- (c) $2x - 5y$
- (d) $c + 3d$

6. Simplify: $(4x^2 - 7x + 9) - (-2x^2 - 2x + 3)$.

- (a) $2x^2 + 5x + 6$
- (b) $6x^2 - 5x + 6$
- (c) $6x^2 - 9x + 12$
- (d) $2x^2 - 9x + 12$

7. Simplify: $\frac{x^2x^{-4}}{x^3}$.

- (a) x^3
- (b) $\frac{1}{x^3}$
- (c) $\frac{1}{x^5}$
- (d) x^5

8. Simplify: $\frac{21x^3 - 28x^2 + 7x}{-7x}$

- (a) $-3x^2 + 4x - 1$
- (b) $21x^3 - 28x^2$
- (c) $-3x^4 + 4x^3 - x^2$
- (d) $-3x^2 + 4x$

9. The solutions of the equation $x^2 - 9x - 22 = 0$ are:

- (a) 2 and -11
- (b) It has no solutions.
- (c) -2 and 11
- (d) -9 and -22

10. Write with only positive exponents:

$$\left(\frac{12x^2y^{-3}}{4x^{-5}}\right)^{-2}$$

- (a) $\frac{y^6}{9x^{14}}$
- (b) $\frac{9y^6}{x^9}$
- (c) $-9y^6x^{-6}$
- (d) $-\frac{6x^6}{y^6}$

11. Expand: $(a + b)^2$

- (a) $a^2 + 2ab + b^2$
- (b) $(a + b)(a - b)$
- (c) $a^2 - b^2$
- (d) $a^2 + b^2$

12. Factor: $x^2 - 9$.

- (a) $(x + 3)^2$
- (b) Cannot be factored.
- (c) $(x + 3)(x - 3)$
- (d) $(x - 9)^2$

13. Multiply: $(3x + 5)(3x - 5)$

- (a) $9x^2 + 30x + 25$
- (b) $6x^2 + 25$
- (c) $9x^2 - 25$
- (d) $6x^2 - 30x + 25$

14. Which of the following is a factor of $3x^3 - 12x$?

- (a) $x - 2$
- (b) $x - 4$
- (c) $x - 3$
- (d) 12

15. Factor completely: $x^2 - 8x - 20$

- (a) $(x - 10)(x + 2)$
- (b) $(x + 10)(x - 2)$
- (c) $(x - 8)(x - 20)$
- (d) $(x - 8)(x + 2)$

16. The solutions of the equation $(x - 3)(x + 1) = 0$ are

- (a) It has no solutions
- (b) 3 and -1
- (c) 2 and -4
- (d) -3 and 1

Free response questions start here. SHOW ALL WORK!!!

17. Factor completely: $3x^3 - 15x^2 + 18x$.

18. Solve the equation $3x^2 + 8x + 5 = 0$.

19. Multiply: $(6x - 3)(6x + 3)$

20. Write the following in simplest radical form:

a) $\sqrt{18}$

b) $\sqrt{72}$

21. Factor completely: $x^4y^3 - 4x^2y^5$

22. A **positive** number is 9 more than another. The product of the two numbers is 52. What are the numbers?