

# MTH 05, Test 3, V. 1, 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. Multiply:  $(4x - 5)(x^2 - 3x + 2)$

(a)  $4x^3 - 12x^2 + 23x - 10$

(b)  $4x^3 - 17x^2 - 7x - 10$

(c)  $4x^3 - 12x^2 - 7x - 10$

(d)  $4x^3 - 17x^2 + 23x - 10$

2. Divide and write in scientific notation:

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

(a)  $9 \times 10^6$

(b)  $9 \times 10^7$

(c)  $0.9 \times 10^6$

(d)  $9 \times 10^5$

3. Write using only positive exponents:

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

(a)  $-\frac{8z^{20}}{x^9y^6}$

(b)  $\frac{z^9}{8y^5}$

(c)  $-\frac{8z^9}{y^5}$

(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)  $(x + 11)$

(c)  $(x - 6)$

(d)  $(x - 5)$

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

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

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

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

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

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

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

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

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

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

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

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

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

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

12. Write with only positive exponents:

- $\left(\frac{12x^2y^{-3}}{4x^{-5}}\right)^{-2}$
- (a)  $\frac{y^6}{9x^{14}}$
  - (b)  $-9y^6x^{-6}$
  - (c)  $\frac{9y^6}{x^9}$
  - (d)  $-\frac{6x^6}{y^6}$

**13.** Which of the following is a factor of

$$3x^3 - 12x?$$

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

**14.** Multiply:  $(3x + 5)(3x - 5)$

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

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

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

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

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

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

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

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

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

20. Write the following in simplest radical form:

a)  $\sqrt{18}$

b)  $\sqrt{72}$

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

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