

MTH 121
Exam 1, Form A
Spring 2013

No calculators.

These formulas may or may not be useful:

$$a^3 + b^3 = (a + b)(a^2 - ab + b^2) \qquad a^3 - b^3 = (a - b)(a^2 + ab + b^2)$$

(For this exam, assume any variables represent positive numbers.)

Justify your answers with *neat and organized* work. 100 points possible.

1. Use absolute value notation to describe the situation.

The distance between x and 7 is no more than 4.

2. Evaluate the expression for the given value of x .

$$x^2 - 4x - 6 \qquad x = -3$$

3. Perform the operation and simplify: $\frac{5}{6} - \frac{2}{3} + \frac{3}{4}$

4. Perform the operation and simplify: $20 \div \frac{1}{5}$

5. Put in simplest exponential form: (1) no radicals, and (2) positive exponents only.

$$\left(\frac{2^3 a^3 c^{-2}}{2a^{-1} c^6} \right)^{-3}$$

6. Put in simplest exponential form: (1) no radicals, and (2) positive exponents only.

$$\frac{(6x^5 y^{-2})^2}{(2xy^4)^3}$$

7. The radicand is a perfect power. Find the specified root. $\sqrt{z^{16} x^4}$

8. The radicand is a perfect power. Find the specified root. $\sqrt[3]{\frac{125}{64} y^{27}}$

9. Simplify by removing perfect powers from the radicand. Leave the radical sign in your answer. $\sqrt[3]{-x^7 w^{10}}$

10. Simplify by removing perfect powers from the radicand. Leave the radical sign in your answer. $\sqrt[4]{\frac{81a^{16}x^5}{16c^{10}t^7}}$

11. Put in simplest exponential form: (1) no radicals, and (2) positive exponents only.

$$x^{1/4}x^8$$

12. Put in simplest exponential form: (1) no radicals, and (2) positive exponents only.

$$\left(\frac{16w^6}{25c^{16}}\right)^{3/2}$$

13. Put in simplest exponential form: (1) no radicals, and (2) positive exponents only.

$$(b^{3/4}x^4)^4$$

14. Put in simplest exponential form: (1) no radicals, and (2) positive exponents only.

$$\sqrt[5]{x}\sqrt[4]{x}$$

15. Multiply and simplify: $(3x^4 - 5)^2$

16. Multiply and simplify: $(x^2 - x + 3)(-2x^2 + 5x + 1)$

17. Factor completely: $15 + 2z - z^2$

18. Factor completely: $4x^3 - 8x^2 - 3x + 6$

19. Factor completely: $12x^2 - 28x - 5$

20. Factor completely: $(x^2 + 15)^2 - 64x^2$