

MTH 121
Exam 1, Form B
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 4 is no more than 7.

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

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

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

4. Perform the operation and simplify: $30 \div \frac{1}{5}$

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

$$\left(\frac{2^3 x^{-2} y^3}{2x^6 y^{-1}} \right)^{-3}$$

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

$$\frac{(6a^{-2}c^5)^2}{(2a^4c)^3}$$

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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