

MATH 111 PRETEST 1

This test is designed to give an example of what types of questions may be on the test.
Show all work for full credit.

1. Rewrite each of the following using interval notation.

a. $x \leq -3$ or $x > 7$

b. $x > 2$ and $x \leq 8$

c. x is greater than 7 but at most 12

d. x is at least 3

2. Perform the operation and write your answer as a polynomial in standard form.

a. $5x - 2(x - 3)$

b. $(2x + 3)^2 - (x - 1)(x^2 - 2x + 3)$

c. $(2x + 5)(x - 7)(3x + 1)$

d. $x - 5[4 - 7(x + 8)]$

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3. Graph the set.

a. $(-\infty, 5] \cap [-2, 9)$

b. $(-\infty, 5] \cup [-2, 9)$

c. $[-4, 3] \cap (-8, 2)$

d. $[-4, 3] \cup (-8, 2)$

4. Simplify each of the following. Express answers with positive exponents only.

a. $\frac{-35x^2y^4}{5x^6y^{-8}}$

b. $(4x^2)^3(2x^5)^{-5}$

c. $\left(\frac{-30a^{14}b^8}{10a^{17}b^{-2}}\right)^{-3}$

d. $\frac{(2x^2y^{-1})^{-3}(4xy^{-3})^2}{(3x^{-4}y)^{-2}}$

5. Simplify the expression and express the answer using rational exponents.

a. $\sqrt[3]{8x^2}\sqrt{16x^5}$

b. $\frac{xy}{\sqrt[3]{27xy^2}}$

c. $\sqrt{x\sqrt{x^3}}$

6. Find the exact value for each of the following without using your calculator.

a. 4^{-2}

b. $16^{1/4}$

c. $64^{-3/2}$

d. $(-27)^{2/3}$

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7. Factor completely.

a. $3x^4 - 9x^3 - 30x^2$

b. $27x^3 - 125$

c. $6x^2 - 11x - 21$

d. $x^4 + x^3 + x + 1$

e. $12x^2 + 28x - 24$

f. $3x^3 - 3x^2 - 12x + 12$

8. Simplify the rational expression.

$$\frac{12 + x - x^2}{2x^2 - 9x + 4}$$

9. Perform the multiplication and simplify. Give your answer in factored form.

$$\frac{2x^2 + x - 6}{x^2 + 4x - 5} \cdot \frac{x^3 - 3x^2 + 2x}{4x^2 - 6x}$$

10. Perform the division and simplify. Give your answer in factored form.

$$\frac{x^3 - 8}{x^2 - 4} \div \frac{x^2 + 2x + 4}{x^3 + 8}$$

11. Perform the subtraction and simplify. Give your answer in factored form.

$$\frac{3}{x-1} - 5$$

12. Perform the addition and simplify. Give your answer in factored form.

$$\frac{2}{x^2 - x - 2} + \frac{10}{x^2 + 2x - 8}$$

13. Perform the addition or subtraction and simplify. Give your answer in factored form.

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

14. Rationalize the denominator. Simplify your answer.

a. $\frac{6}{\sqrt{6+2\sqrt{3}}}$

b. $\frac{3+\sqrt{6}}{2-\sqrt{6}}$

15. Solve for R .

$$x = \sqrt{\frac{Ry}{4q}}$$

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16. Solve.

$$\frac{12}{x^2 - 2x - 8} - \frac{2}{x - 4} = \frac{7}{x + 2}$$

17. Solve.

$$\frac{2}{x - 3} - \frac{8}{x^2 - 9} = \frac{4}{x + 3}$$

18. Solve.

$$\frac{24}{x^2 - 4x - 12} + \frac{3x - 1}{x - 6} = \frac{2x + 3}{x + 2}$$

19. Solve each of the following equations by factoring.

a. $x^3 + 3x^2 - x - 3 = 0$

b. $4x^2 - 6x - 10 = x^2 - 9x + 8$

20. Solve the following power equation. Simplify.

a. $(x + 13)^2 - 25 = 0$

21. Use the Quadratic Formula to solve. Give the exact answer and simplify.

a. $x^2 + 14x + 44 = 0$

b. $25x^2 - 20x + 3 = 0$

22. Solve the following by completing the square. Give the exact answer.

$$x^2 + 8x + 14 = 0$$

23. Solve the following by completing the square. Give the exact answer.

$$2x^2 + 8x - 18 = 0$$

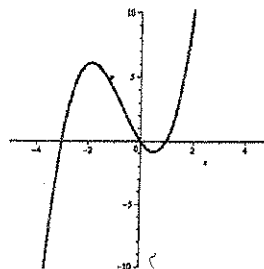
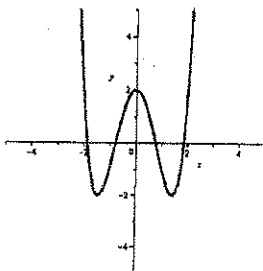
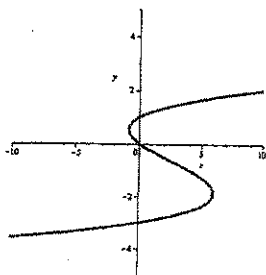
24. Solve the inequality and give your answer in interval notation.

$$\frac{1}{2}(8x + 1) \geq 3x + \frac{5}{2}$$

25. Solve the inequality and give your answer in interval notation.

$$-1 < 2 - \frac{x}{3} < 1$$

26. Decide whether each of the following could be the graph of a function.



27. In each of the following cases, decide which of the following statements is true:

- A. y is a function of x
- B. x is a function of y
- C. both A and B
- D. None of the above.

Explain your answers.

a.

x	-9	-8	-7	-5	-4
y	14	8	0	-9	13

b.

x	-4	1	-6	-7	1
y	6	1	5	10	4

For each of the equations below, solve for the indicated variable. Simplify your answers. Your final answer should not have complex rational expressions.

28. Solve for s .

$$P = L + \frac{sx}{f}$$

29. Solve for f .

$$P = L + \frac{sx}{f}$$

30. Solve for d .

$$L = A + (n - 1)d$$

31. Solve for n .

$$L = A + (n - 2)\frac{180}{n}$$