

MATH 115 Test 2 (8.3 - 9.5)

**Show all your work. No work no credit**

1. (4 pts.) Write the equation of the the line through  $(7, -2)$  and  $(2, -7)$ .  
Write the equation in general form.

2. (3 each) Rationalize each denominator. All variables represent positive numbers..

a)  $\frac{3}{\sqrt{5}}$

b)  $\frac{5}{\sqrt{x} - 2}$

c)  $\frac{2}{\sqrt[3]{10}}$

d)  $\frac{5}{\sqrt[4]{a^2}}$

4. (4 pts.) Write the equation of the line that is perpendicular to the line  $x = -8y - 7$  and passing through the point  $(0, 0)$ . Write the equation in slope-intercept form.

5. (2 each) Let  $f(x) = x - 7$ . Evaluate

a)  $f(1) + f(-1)$

b)  $f(b) - f(a)$

6. (2 each) multiply and simplify. Assume all variables are positive.

a)  $\sqrt{2}\sqrt{8}$

b)  $\sqrt[3]{6xy^2}\sqrt[3]{36x^3}$

c)  $5\sqrt{3}(6\sqrt{7} + 2\sqrt{2})$

d)  $(\sqrt{7x} + \sqrt{7})^2$

7. (2 each) Graph the following **Without** the use of graphing calculators:

a)  $f(x) = \sqrt{x}$

b)  $g(x) = \sqrt{x+1}$

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c)  $h(x) = \sqrt{x} - 2$

d)  $k(x) = -\sqrt{x} + 2$

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8. (3 pts) Find the domain of the function  $f(x) = \frac{3}{(x+2)(x-1)}$

9. (2 each) Simplify each expression. Assume that all variables are positive

a)  $\sqrt{2x}\sqrt{2x}$

b)  $\sqrt{72}$

c)  $\sqrt{27a^7}$

d)  $\sqrt[4]{32x^{12}y^4}$

10. (3 each) Simplify and combine like terms. Assume all variables are positive.

a)  $\sqrt{200} - \sqrt{72} + \sqrt{50}$

b)  $\sqrt[3]{24x^3} - \sqrt[3]{81x^3}$

11. (4 pts.) The pressure of a certain amount of gas is directly proportional to the temperature (measured in kelvin) and inversely proportional to the volume. A sample of gas at a pressure of 1 atmosphere occupies a volume of 1 cubic meter at a temperature of 273 kelvin. When heated the gas expands to 4 cubic meters, but the pressure remains the same. To what temperature is it heated?

12. (1 each) Simplify each expression, if possible. Assume all variables are positive.

a)  $\sqrt{-5^2}$

b)  $\sqrt[3]{-64a^6b^9}$

c)  $\sqrt[4]{\frac{81}{625}}$

d)  $\sqrt[5]{-243x^5}$

13. (2 each) Simplify each radical and exponential expression. Assume that all variables are unrestricted, and use absolute value symbols where necessary.

a)  $\sqrt{(x-2)^{52}}$

b)  $(-125)^{1/3}$

c)  $\sqrt[4]{\frac{81}{16}x^4}$

d)  $(-27)^{4/3}$

e)  $(9c^4d^6)^{-3/2}$

f)  $-81^{-3/4}$

g)  $\left(\frac{1}{25y^6}\right)^{-3/2}$

h)  $(49)^{5/2}$

14. (4 pts.) Find  $a$ .

15. (4 pts) Given the points  $P(-7, -4)$  and  $Q(5, 1)$ . Find the distance between  $P$  and  $Q$

16. (3 each) Solve the proportion and check your answers.

a)  $\frac{x}{5} = \frac{45}{25}$

b)  $\frac{2}{x+5} = \frac{-2x}{4}$

17. (5 pts. **BONUS**) Multiply and simplify :  $(\sqrt[3]{x} - \sqrt[3]{y})(\sqrt[3]{x^2} + \sqrt[3]{xy} + \sqrt[3]{y^2})$