Intermediate Algebra NAME:
Practice Exam 3
Sections 10.1 – 10.6

Use the test itself as scratch paper. Print your name at the top of your test. Show work for possible partial credit. The number in parentheses is the point value of the question.

Circle your final answers. Good luck! The rules of exponents, given below, are true for real numbers a, b, m, and n.

$a^m * a^n = a^{m+n}$ $\qquad$ $\left(a^m\right)^n = a^{mn}$

$\left(ab\right)^n = a^n b^n$ $\qquad$ $\left(\frac{a}{b}\right)^n = \frac{a^n}{b^n}, b \neq 0$

$\frac{a^m}{a^n} = a^{m-n}, a \neq 0$ $\qquad$ $a^0 = 1, a \neq 0$

$a^{-n} = \frac{1}{a^n}, a \neq 0$

The distance between two points (x_1, y_1) **and** (x_2, y_2) **is given by** $d = \sqrt{\left(x_2 - x_1\right)^2 + \left(y_2 - y_1\right)^2}$ **.**
The midpoint of the segment between two points (x_1, y_1) **and** (x_2, y_2) **is the point with coordinates** $\left(\frac{x_1 + x_2}{2}, \frac{y_1 + y_2}{2}\right)$**.**

1. (6) Find the following on your calculator. Write your answers as decimals, rounded to two decimal places.

a.) $\sqrt{48}$

b.) $\sqrt[4]{4096}$

c.) $\sqrt[3]{99}$

2. (3) Simplify the following. Assume all variables represent non-negative numbers.

$\sqrt{64x^8y^2}$

3. (3) Let $f(x) = \sqrt{5x+6} - 2$. Find $f(6)$.

4. (3) Simplify the following. (If it helps to write it as a radical expression first, then do so. However, I will not deduct points for leaving this step out.)

$\left(125x^6y^3\right)^{1/3}$

5. (3) Simplify the following using the rules of exponents. Leave your answer with fractional exponents.

$y^{1/2}y^{1/3}$

6. (3) Rewrite the following with positive exponents. Then simplify your answer. Leave your answer as a fraction.

$36^{-1/2}$

7. (3) Solve the following equation. Be sure to check your answer(s).

$\sqrt{x+4} = 5$

8. (3) Solve the following equation. Be sure to check your answer(s) and cross out any that turn out to be wrong.

$x = \sqrt{6x-8}$

9. (3) What is the difference between $\sqrt{-36}$ and $-\sqrt{36}$? (Notice where the negative sign is and think about how this affects it.)

10. (3) Completely simplify the following. Assume all variables represent non-negative numbers.

$$\frac{\sqrt{180x^4}}{6x}$$

11. (3) Algebraically find the midpoint of the segment whose endpoints are (5, -10) and (0, 6). Show your work.

12. (3) Perform the indicated operation and completely simplify the following. Assume all variables represent non-negative numbers.

$\left(\sqrt{4x}+7\right)\left(\sqrt{x}-5\right)$

These are multiple-choice questions. Write the letter of your choice in the blank provided.

13. (3) Perform the indicated operation and completely simplify the following. Assume all variables represent non-negative numbers. 13. _____

$\sqrt{\frac{28}{x^2}}+\sqrt{\frac{7}{4x^2}}$

a.) no solution

b.) $\frac{\sqrt{35}}{2x^2}$

c.) $\frac{5\sqrt{7}}{2x}$

d.) $\frac{119}{4x^2}$

e.) $\frac{\sqrt{7}}{x}$

14. (3) Rationalize the denominator. Completely simplify your final answer. 14. _____

$$\frac{\sqrt{5x^2}}{\sqrt{7}}$$

a.) $\frac{\sqrt{35}x}{7}$

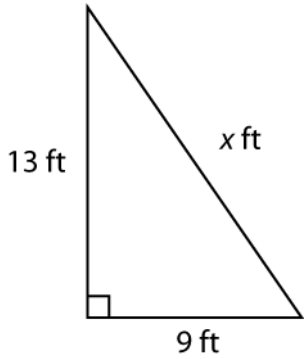
b.) $\frac{5x}{1}$

c.) $\frac{5x^2}{7}$

d.) $\frac{\sqrt{5}x}{\sqrt{7}}$

e.) $\frac{5x}{\sqrt{35}}$

15. (3) Find the length of the hypotenuse for the right triangle shown below. Convert your answer to decimal form, rounded to two decimal places. 15. _____



a.) 22 ft
b.) 15.81 ft
c.) 6.61 ft
d.) 484 ft
e.) 9.38 ft