Math-1003b Exam #3

Name: _____

This exam is closed book and notes. You may use a scientific calculator; however, no other electronics are allowed. Show all work; there is no credit for guessed answers. All answers must be in simplified form with no negative exponents.

1). Simplify the following expressions:

a). $\sqrt[4]{16r^8t^{32}}$

b). $\sqrt[5]{-32x^{30}y^{45}}$

2). You are standing in front of a building with a second floor window. You don't have access to the building, but you need to know how high up the window is on the wall of the building. You have a 20 foot ladder that you lay against the side of the building so that the top of the ladder touches the bottom of the window. The bottom of the ladder is 3 feet away from the building. How high is the window?

3). Convert each of the following expressions to radical form and then simplify them. If the expression does not represent a real number then say "not a real number". When simplifying, you may start with either the rational exponent or radical form:

a). $16^{\frac{3}{4}}$

b). $81^{-\frac{1}{2}}$

c). $(-49)^{\frac{3}{2}}$

d). $-100^{\frac{1}{2}}$

e). $(-8)^{-\frac{4}{3}}$

4). Simplify the following expressions. You may assume that the domain for all the variables is $[0, \infty)$.

a).

$$\left(x^{\frac{1}{3}} x^{\frac{1}{6}}\right)^{12}$$

b).

$$\left(\frac{4t^{-\frac{2}{3}}}{t^{\frac{4}{3}}}\right)^{2}$$

5). Simplify the following expressions. You may assume that the domain for all the variables is $[0, \infty)$:

a). $\sqrt[3]{54} - \sqrt[3]{128}$

b). $5p\sqrt{18p^2q^3} + p^2q\sqrt{32q}$

6). Perform the following operations and simplify the results:

a). $(2\sqrt{3} - 3\sqrt{5})(\sqrt{3} + 2\sqrt{5})$

b). $(\sqrt{x} - 7)(\sqrt{x} + 7)$

7). Rationalize the denomimators for the following expressions and simplify. You may assume that the domain for all the variables is $[0, \infty)$:

a).

$$\frac{4}{\sqrt[3]{2a}}$$

b).

$$\frac{3}{\sqrt{x} - 3}$$

8). Solve for x:

$$3 + \sqrt[3]{x - 16} = 1$$

9). Solve for x:

$$3 + \sqrt{x - 16} = 1$$

10). Solve for x:

$$\sqrt{2x + 6} + 1 = x$$