Chapter 11 Unit Test - Radicals and Complex Numbers

Name_____ Section_____

Be sure to show all your work and circle your answer.

What is the domain of the following:

1a) $g(x) = \sqrt{7x-3}$

1b) $h(x) = \sqrt[5]{4x+5}$

Simplify the following. Write your answers as radicals if possible:

2) $\sqrt{75}$

3) $\sqrt{64a^2b^2}$

4) $(x^{-2/3} \cdot x^{3/4})^{1/3}$

5) $\dfrac{\sqrt[4]{(3x-5)^6}}{\sqrt[4]{(3x-5)^2}}$

6) $\sqrt[5]{x^6-3x^5} - x\sqrt[5]{32x-96}$

7) $-5\sqrt{200} - 3\sqrt{50} + 7\sqrt{72}$

8) $\left(\sqrt{3x} - \sqrt{6y}\right)^2$

9) $\sqrt[3]{32x^4y} \cdot \sqrt[5]{16x^4y^8}$

Rationalize the denominator of the following:

10) $\dfrac{\sqrt{6}-3}{\sqrt{5}+2}$

11) $\dfrac{6}{\sqrt{3}}$

Perform the indicated operations and write your answer in standard form:

12) $(8 + 7i) - i^{200} + i^{451}$

13) $(-5 + 3i)(2 - 6i)$

14) $\dfrac{5+9i}{4-3i}$

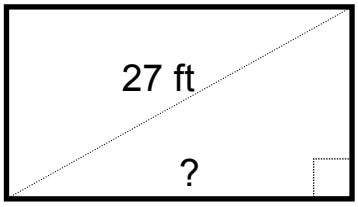
15) $\dfrac{-3+\sqrt{-18}}{6}$

Solve the following:

16) $\sqrt{-2x-3} = x + 3$

17) $\sqrt{x-5} = 2 - \sqrt{x+3}$

18) If the diagonal of a rectangle is 27 feet and the width of the rectangle is 16 feet, find the length of the rectangle.



16 ft

Answers:

1a) $\left[\frac{3}{7}, \infty\right)$ 1b) $(-\infty, \infty)$ 2) $5\sqrt{3}$ 3) $8\,|ab|$ 4) $\sqrt[36]{x}$

5) $|3x - 5|$ 6) $-x\sqrt[5]{x-3}$ 7) $-23\sqrt{2}$

8) $3x - 6\sqrt{2xy} + 6y$ 9) $4x^2y\sqrt[15]{128x^2y^{14}}$

10) $\sqrt{30} - 2\sqrt{6} - 3\sqrt{5} + 6$ 11) $2\sqrt{3}$ 12) $7 + 6i$

13) $8 + 36i$ 14) $-\frac{7}{25} + \frac{51}{25}i$ 15) $-\frac{1}{2} + \frac{\sqrt{2}}{2}i$

16) $\{-2\}$ 17) $\{\ \}$ 18) $\sqrt{473} \approx 21.75$ feet.