Algebra 2 Name_____
Practice Test – Unit 2

For questions 1 – 4, simplify each expression.

1. $\sqrt[3]{x^2} \cdot \sqrt[5]{x^3}$ 1._____

2. $\dfrac{\sqrt[3]{32m^{14}}}{\sqrt[3]{4m^2}}$ 2._____

3. $\dfrac{7^{-5} \cdot \sqrt[4]{162n^{21}}}{7^{-6} \cdot \sqrt[4]{2n}}$ 3._____

4. $\dfrac{1}{\left(27^{\frac{1}{3}} m^{\frac{3}{4}}\right)^{-4}}$ 4._____

5. Which of the following expressions is equivalent to $4m^2$ 5._____

a. $\dfrac{2^{-4} \cdot \sqrt[4]{m^{16}}}{2^{-6} \cdot \sqrt[4]{m^8}}$ b. $\dfrac{\left(2m^{\frac{1}{3}}\right)^5}{8m^{\frac{7}{6}}}$ c. $\dfrac{\sqrt[4]{32m^{10}}}{8 \cdot \sqrt[4]{2m^4}}$ d. $\dfrac{1}{\left(64^{\frac{1}{3}} m\right)^{-2}}$

6. Let $f(x) = 6x - 11$ and $g(x) = x^2 - 8x + 15$.

a. $(f + g)(x)$ a._____

b. $(f - g)(x)$ b._____

c. $(fg)(x)$ c._____

d. $\left(\frac{f}{g}\right)(x)$ d._____

7. Let $f(x) = x^2 - 3x + 10$ and $g(x) = 2x - 1$. 7._____
Find $f(g(x))$.

8. Let $f(x) = 15x^{\frac{3}{4}}$ and $g(x) = \frac{5}{x}$. Find $g(f(x))$. 8._____

a. $g(f(x)) = \frac{\sqrt[4]{15x}}{5x}$

b. $g(f(x)) = \frac{15 \cdot \sqrt[4]{15x}}{x}$

c. $g(f(x)) = \frac{75 \cdot \sqrt[4]{x^2}}{x}$

d. $g(f(x)) = \frac{\sqrt[4]{x}}{3x}$

9. Find the inverse of $g(x)=\frac{1}{4}x-3$. 9._____

10. Find the inverse of $f(x)=\frac{1}{3}x^5+7$. 10._____

11. Determine whether $f(x)=x-2$ and $g(x)=-x+2$ are inverse functions. 11._____

a. $f(x)$ and $g(x)$ are inverse functions because $f(x)\text{-}\,g(x)=0$
b. $f(x)$ and $g(x)$ are inverse functions because $f(g(x))=x$
c. $f(x)$ and $g(x)$ are inverse functions because $f(g(x))=-x$
d. $f(x)$ and $g(x)$ are not inverse functions because $f(g(x))$ does not equal x

12. Simplify: $\log_4 64+\log\left(10^{11}\right)-\ln\left(e^5\right)-\log_6 216$ 12._____

13. Solve: $2.75^{4x-8}=\left(\frac{121}{16}\right)^{3x+5}$ 13._____

14. Solve: $\log_4(-x)=2-\log_4(x+10)$ 14._____

ANSWER KEY

1. $x^{\frac{19}{15}}$
2. $2m^4$
3. $21n^5$
4. $81m^3$
5. A
6. a) $x^2 - 2x + 4$

   b) $-x^2 + 14x - 26$

   c) $6x^3 - 59x^2 + 178x - 165$

   d. $\frac{6x-11}{x^2-8x+15}, x \neq 5,3$
7. $4x^2 - 10x + 14$
8. D
9. $y = 4x + 12$
10. $y = \sqrt[5]{3x - 21}$
11. D
12. 6
13. -9
14. -8 and -2