1. Which expression is equivalent to $\frac{x^3y^4}{3x^2y^{-1}}$?
   1) $\frac{x^4y^5}{3}$  
   2) $\frac{x^3y^4}{3}$  
   3) $3x^5y^5$  
   4) $x^6y^5$  

   $= \frac{1}{3}x^4y^5$

2. Simplify: $\sqrt[5]{50x^2y^3}$
   $= 5xy\sqrt[5]{2x}$

3. Simplify: $\frac{\sqrt[5]{a^3b^6c^{12}}}{a^{5/3}b}$
   $= -3ab^2\sqrt[5]{a}$

4. The expression $\frac{4\sqrt[3]{a^2}}{a^4}$ is equivalent to
   1) $\frac{4a}{a^4}$  
   2) $\frac{4a^3}{a}$  
   3) $4a^3\sqrt[3]{a}$  
   4) $4a^\frac{3}{2}$

3

5. Simplify the expression $\sqrt[3]{3x^3} - 2\sqrt[3]{5x}$
   $= \frac{5x\sqrt[3]{3x} - 6\sqrt[3]{5x}}{1 \times \sqrt[3]{3x}}$
   $= -1x\sqrt[3]{3x}$

6. Solve for $x$: $\sqrt{x+14} = (k+2)$
   
   $x + 14 = x^2 + yx + y$
   
   $-x = -y$
   
   $x^2 + 3x - 10 = 0$
   
   $(x+5)(x-2) = 0$
   
   $x = -5$ or $x = 2$
   
   $x = 2$

7. Solve for $x$: $\sqrt{4x - 4} - \sqrt{x + 8} = 0$
   
   1) 1  
   2) -8  
   3) -4  
   4) 4

8. Solve the following system of equations:
   $x^2 + 8 = 9$
   
   $x = 3$
   
   $2x(x-3) = 0$
   
   $\frac{2x(x-3)}{x-3} = 0$
   
   $x = 0$, $x = 3$
   
   $2x = 1$
   
   $x = \frac{1}{2}$
   
   $y = \frac{3}{2}$
   
   $x = 3$
   
   $y = 3$
   
   $y = 0$
   
   $y = -3$
Unit 6 Questions

9. If $5000 is invested at a rate of 3% compounded quarterly, what is the value of the investment in 5 years?
   - (1) $5190.33
   - (2) $5796.37
   - (3) $5805.92
   - (4) $5808.08

10. What is the domain of $f(x) = 2^x + 2$?
   - (1) All integers
   - (2) All real numbers
   - (3) $y > 0$
   - (4) $y > 2$

11. Susie invests $500 in an account that is compounded continuously at an annual interest rate of 5%, according to the formula $A = Pe^{rt}$, where $A$ is the amount accrued, $P$ is the principal, $r$ is the rate of interest, and $t$ is the time, in years. Approximately how many years will it take for Susie's money to double?
   - (1) 1.4
   - (2) 6.0
   - (3) 13.9
   - (4) 14.7

12. The value of $x$ in the equation $4^{2x+5} = 8^3x$ is
   - (1) 1
   - (2) 2
   - (3) 5
   - (4) -10

13. Akeem invests $25,000 in an account that pays 4.75% annual interest compounded continuously. Using the formula $A = Pe^{rt}$, where $A$ = the amount in the account after $t$ years, $P$ = principal invested, and $r$ = the annual interest rate, how many years, to the nearest tenth, will it take for Akeem's investment to double?
   - (1) 10.0
   - (2) 14.6
   - (3) 23.1
   - (4) 24.0

14. The solution set to the equation $3^{2x} = 11$ is
   - (1) $\left\{ \frac{\log 11}{2\log 3}, \frac{\log 11}{\log 9} \right\}$
   - (2) $1.0913$
   - (3) both choices (1) and (2)
   - (4) {}