

**Operations on Functions**

1. Find  $(f \cdot g)(x)$  for  $f(x) = 3x^2$  and  $g(x) = 5 - x$ .  
**A.**  $3x^2 - x + 5$                       **B.**  $75 - 30x + 3x^2$   
**C.**  $3x^2 - 15x^2$                       **D.**  $15x^2 - 3x^3$
2. Find  $(f - g)(x)$  for  $f(x) = x^2 + 8x$  and  $g(x) = 3x + 5$ .  
**A.**  $-x^2 - 5x + 5$     **B.**  $x^2 + 5x + 5$     **C.**  $x^2 + 5x - 5$     **D.**  $x^2 + 11x + 5$

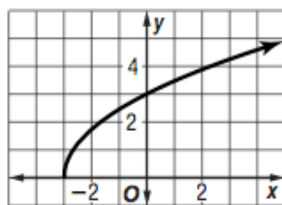
**Inverse Functions and Relations**

3. Find the inverse of  $f(x) = 2x - 7$ .  
**A.**  $f^{-1}(x) = 7x - 2$                       **B.**  $f^{-1}(x) = \frac{1}{2}x + 7$   
**C.**  $f^{-1}(x) = \frac{x+7}{2}$                       **D.**  $f^{-1}(x) = x + \frac{7}{2}$
4. Find the inverse of  $f(x) = 3 + 5x$ .  
**A.**  $f^{-1}(x) = 5 + 3x$                       **B.**  $f^{-1}(x) = \frac{x-3}{5}$   
**C.**  $f^{-1}(x) = \frac{3+5x}{5}$                       **D.**  $f^{-1}(x) = -3 + \frac{1}{5}x$
5. Determine which pair of functions are inverse functions.  
**A.**  $f(x) = 3x - 1$     **B.**  $f(x) = 2x - 5$     **C.**  $f(x) = 2x + 2$     **D.**  $f(x) = 3x - 8$   
 $g(x) = \frac{1}{3x-1}$      $g(x) = \frac{x+5}{2}$      $g(x) = 2x - 2$      $g(x) = \frac{1}{3}x + 8$
6. Determine which pair of functions are *not* inverse functions.  
**A.**  $g(x) = 2x + 9$     **B.**  $g(x) = x - 1$     **C.**  $g(x) = 3x - 6$     **D.**  $g(x) = 3x + 4$   
 $h(x) = \frac{1}{2}x - 9$      $h(x) = x + 1$      $h(x) = \frac{1}{3}x + 2$      $h(x) = \frac{x-4}{3}$

**Square Root Functions**

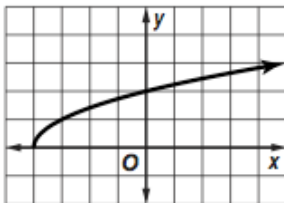
7. State the domain and range of the function graphed at the right.

- A.**  $D: x > -3, R: y > 0$   
**B.**  $D: x > -3, R: y < 0$   
**C.**  $D: x \geq -3, R: y \geq 0$   
**D.**  $D: x \geq -3, R: y > 0$



8. State the domain and range of the function graphed at the right.

- A.**  $D: x > -4, R: y > 0$   
**B.**  $D: x \geq -4, R: y \geq 0$   
**C.**  $D: x \geq -4, R: y \leq 0$   
**D.**  $D: x > -4, R: y < 0$



1. \_\_\_\_\_

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3. \_\_\_\_\_

4. \_\_\_\_\_

5. \_\_\_\_\_

6. \_\_\_\_\_

7. \_\_\_\_\_

8. \_\_\_\_\_

Operations with Radicals

9. Simplify  $\sqrt{48}$ .  
 A.  $16\sqrt{3}$       B.  $4\sqrt{3}$       C. 6      D.  $4\sqrt{6}$
10. Simplify  $\sqrt{64n^6w^4}$ .  
 A.  $8|n^3|w^2$       B.  $8n^3w^2$       C.  $\pm 8n^3w^2$       D.  $32|n^3|w^2$
11. Simplify  $\sqrt[3]{625x^5}$ .  
 A.  $-25\sqrt[3]{x}$       B.  $25x^2$       C.  $5x\sqrt[3]{5x^2}$       D.  $-5x\sqrt[3]{5x}$
12. Simplify  $\sqrt{5} + \sqrt{20} - \sqrt{27} + \sqrt{147}$ .  
 A.  $5\sqrt{3} + 6$       B.  $3\sqrt{5} + 4\sqrt{3}$       C.  $3\sqrt{5} + 10\sqrt{3}$       D.  $2\sqrt{5} - 3\sqrt{3}$
13. Simplify  $\sqrt{32} - \sqrt{18} + \sqrt{54} + \sqrt{150}$ .  
 A.  $7\sqrt{2} - 2\sqrt{6}$       B.  $7\sqrt{2} + 8\sqrt{6}$       C.  $3\sqrt{2} + 3\sqrt{6}$       D.  $\sqrt{2} + 8\sqrt{6}$
14. Simplify  $\frac{6}{4 + \sqrt{2}}$ .  
 A.  $\frac{12 - 6\sqrt{2}}{7}$       B.  $\frac{4 - \sqrt{2}}{2}$       C.  $\frac{4 - \sqrt{2}}{3}$       D.  $\frac{12 - 3\sqrt{2}}{7}$
15. Simplify  $\frac{5}{2 - \sqrt{3}}$ .  
 A.  $10 + 5\sqrt{3}$       B.  $10 - 5\sqrt{3}$       C.  $-10 - 5\sqrt{3}$       D.  $-10 + 5\sqrt{3}$

Fractional Exponents

16. Write the expression  $5^{\frac{1}{7}}$  in radical form.  
 A.  $\sqrt[7]{51}$       B. 35      C.  $\sqrt[7]{5}$       D.  $\sqrt[5]{7}$
17. Write the radical  $\sqrt[6]{y^4}$  using rational exponents.  
 A.  $y^{\frac{1}{6}}$       B.  $y^{\frac{3}{2}}$       C.  $y^{\frac{2}{3}}$       D.  $y^{24}$
18. Simplify the expression  $m^{\frac{2}{5}} \cdot m^{\frac{1}{5}}$ .  
 A.  $m^{\frac{5}{3}}$       B.  $m^{\frac{3}{5}}$       C.  $m^{\frac{2}{25}}$       D.  $m^{\frac{2}{5}}$
19. Simplify the expression  $\frac{t^{\frac{3}{4}}}{t^{\frac{1}{5}}}$ .  
 A.  $t^{-2}$       B.  $t^{\frac{11}{20}}$       C.  $t^{\frac{19}{20}}$       D.  $t^{\frac{3}{20}}$

Solving Radical Equations

20. Solve  $\sqrt{3x + 4} = 5$ .  
 A. -7      B. 7      C. 21      D.  $\frac{25}{3}$

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10. \_\_\_\_\_

11. \_\_\_\_\_

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19. \_\_\_\_\_

20. \_\_\_\_\_

21. A correct step in the solution of the equation  $(2m + 1)^{\frac{1}{4}} - 2 = 1$  is \_\_\_\_\_.

A.  $(2m + 1) - 16 = 1$

B.  $2m + 1 = 81$

C.  $(2m + 1)^{\frac{1}{4}} = 1$

D.  $2m + 1 = 3^{\frac{1}{4}}$

22. A correct step in the solution of the equation  $(5z - 1)^{\frac{1}{3}} - 3 = 1$  is \_\_\_\_\_.

A.  $5z - 1 = 4^{\frac{1}{3}}$

B.  $(5z - 1) - 27 = 1$

C.  $(5z - 1) - 9 = 3$

D.  $5z - 1 = 64$

21. \_\_\_\_\_

22. \_\_\_\_\_