

Chapter 6 Test Review Worksheet

Part 1 - NO Calculator

1. Evaluate $64^{\frac{2}{3}}$ $(\sqrt[3]{64})^2 = 4^2 = 16$

2. What is the radical form of $y^{\frac{5}{2}}$? $(\sqrt{y})^5$

3. Which expression is the simplest form of $4\sqrt[3]{54} - \sqrt[3]{250}$?
 $4\sqrt[3]{27 \cdot 2} - \sqrt[3]{125 \cdot 2}$
 $4 \cdot 3\sqrt[3]{2} - 5\sqrt[3]{2}$
 $12\sqrt[3]{2} - 5\sqrt[3]{2} = 7\sqrt[3]{2}$

4. Assuming all variables are positive, what is the simplified form of $y^4\sqrt[4]{32x^6} + \sqrt[4]{162x^6}y^4$?
 $y^4\sqrt[4]{16 \cdot 2} \cdot \sqrt[4]{x^6} + \sqrt[4]{81 \cdot 2} \cdot \sqrt[4]{x^6} \cdot y^4$
 $y^4 \cdot 2 \cdot \sqrt[4]{2} \cdot x^{\frac{3}{2}} + 3 \cdot \sqrt[4]{2} \cdot x^{\frac{3}{2}} \cdot y^4$
 $2xy^4\sqrt[4]{2x^2} + 3xy^4\sqrt[4]{2x^2} = 5xy^4\sqrt[4]{2x^2}$

5. If $h(t) = t^{\frac{1}{2}} + 6$ and $j(t) = 4t^{\frac{1}{2}} - 6$, what is $h(t) - j(t)$?
 $(t^{\frac{1}{2}} + 6) - (4t^{\frac{1}{2}} - 6)$
 $t^{\frac{1}{2}} + 6 - 4t^{\frac{1}{2}} + 6 = -3t^{\frac{1}{2}} + 12$

6. What is $g(f(x))$ if $f(x) = 2x^{\frac{1}{2}}$ and $g(x) = 10x^2$ fully simplified?
 $10(2x^{\frac{1}{2}})^2 = 10(2^2x) = 40x$

7. What is the inverse of the function $h(x) = 25x^2$?
 $y = 25x^2 \rightarrow x = \sqrt{\frac{y}{25}} \rightarrow \sqrt{\frac{x}{25}} = \sqrt{y} \rightarrow y = \frac{\sqrt{x}}{5}$
 $h^{-1}(x) = \frac{\sqrt{x}}{5}$

8. The graph of $y = \sqrt[3]{x}$ is stretched by 2, shifted 4 units down and 5 units to the left. What is its equation?
 $y = 2\sqrt[3]{x+5} - 4$

9. What are the domain and range of the function $y = 12\sqrt{x+5}$?
 Domain: $\mathbb{R} \geq -5$
 Range: $\mathbb{R} \geq 0$

Part 2 - Calculator Allowed

Simplify each expression.

1. $\sqrt[4]{240x^5y^8x^3}$

$$\sqrt[4]{16} \cdot \sqrt[4]{15} \cdot \sqrt[4]{x^5} \cdot \sqrt[4]{y^8} \cdot \sqrt[4]{x^3}$$

$$2 \cdot \sqrt[4]{15} \cdot x \sqrt[4]{x} \cdot y^2 \cdot \sqrt[4]{x^3}$$

$$2x^2y^2\sqrt[4]{15xx^3} = 2x^2y^2\sqrt[4]{15}$$

2. $\frac{\sqrt[3]{15}}{\sqrt[3]{9}} \cdot \frac{\sqrt[3]{3}}{\sqrt[3]{3}}$

$$\frac{\sqrt[3]{15}}{3}$$

3. $x\sqrt{12x^3} + 5\sqrt{3x^5}$

$$x \cdot 2\sqrt{3} \cdot \sqrt{x^3} + 5 \cdot \sqrt{3} \cdot \sqrt{x^5}$$

$$2x^2\sqrt{3x} + 5x^2\sqrt{3x}$$

$$7x^2\sqrt{3x}$$

4. What is $f(g(2))$ if $f(x) = 2x^2 - 15$ and $g(x) = 48x^{-3}$?

$$g(2) = 48 \cdot 2^{-3} = \frac{48}{8} = 6$$

$$f(6) = 2(6)^2 - 15 = 57$$

$$f(g(2)) = 57$$

For #5 & 6, let $f(x) = 3x^{2/5}$ and $g(x) = 15x^{2/5}$. Perform the indicated operation and state the domain.

5. $f(x) \cdot g(x)$

$$3x^{2/5} \cdot 15x^{2/5}$$

$$45x^{4/5} \quad D: \mathbb{R}$$

6. $\frac{g(x)}{f(x)}$

$$\frac{15x^{2/5}}{3x^{2/5}} = 5 \quad D: \mathbb{R} \neq 0$$

Can't be zero because original functions can't be zero in order to divide

7. Find the inverse of $y = 6x^2 - 7$. Show work.

$$x = 6y^2 - 7$$

$$x + 7 = 6y^2 \rightarrow \sqrt{\frac{x+7}{6}} = y$$

$$y^{-1} = \sqrt{\frac{1}{6}x + \frac{7}{6}}$$

8. The cost (in dollars) of producing x sneakers in a factory is given by $C(x) = 60x + 750$. The number of sneakers produced in t hours is given by $x(t) = 50t$. Find $C(x(t))$. Evaluate $C(x(5))$ explain what this number represents.

$$C(x(t)) = 60(50t) + 750$$

$$= 3000t + 750$$

$$C(x(5)) = 3000(5) + 750$$

$$= 15,750$$

$$C(x(t)) = 3000t + 750$$

$$C(x(5)) = 15,750$$

Explain the cost of producing 5 hrs. of sneakers

Solve each equation below. Show your work.

9. $(x-5)^{\frac{5}{3}} - 73 = 170$

$(x-5)^{\frac{5}{3}} = 243^{\frac{3}{5}}$
 $x-5 = \sqrt[5]{243^3}$
 $x-5 = 3^3$
 $x-5 = 27$
 $x = 32$

10. $\sqrt[3]{2x+5} - 3 = 24$

$(\sqrt[3]{2x+5})^3 = (27)^3$
 $2x+5 = 19683$
 $2x = 19678$
 $x = 9839$

11. $(x+3)^2 = \sqrt{2x+14}$

$x^2 + 6x + 9 = 2x + 14$
 $x^2 + 4x - 5 = 0$
 $(x+5)(x-1) = 0$

$x = -5, 1$ -5 extraneous

#12 & #13 No calculator on test

12. Graph the function and state the domain and range. In the table include 3 points from the parent function, $y = \sqrt{x}$. Show the transformations of the points by completing the table.

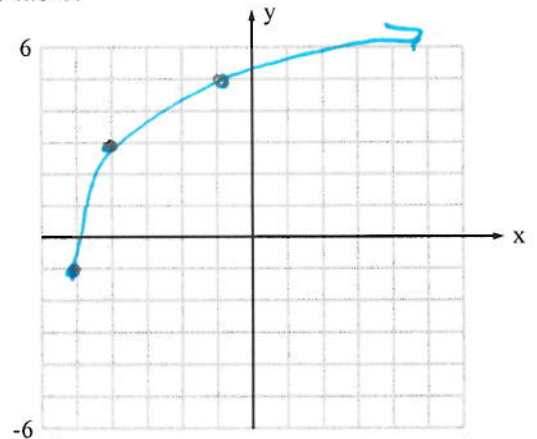
$y = 3\sqrt{x+5} - 1$ Domain: $\mathbb{R} \geq -5$ Range: $\mathbb{R} \geq -1$

Basic

x	0	1	4	-5
y	0	1	2	-3 -1

New

x	-5	-4	-1
y	-1	3	5



13. Graph the function and state the domain and range. In the table include 5 points from the parent function, $y = \sqrt[3]{x}$. Show the transformations of the points by completing the table.

$y = -3\sqrt[3]{x+1}$ Domain: \mathbb{R} Range: \mathbb{R}

Basic

x	-8	-1	0	1	8	same
y	-2	-1	0	1	2	-3 + 1

New

x	-8	-1	0	1	8
y	7	5	1	-2	-5

