KEY

6.4 through 6.7 TEST REVIEW

Learning Target 6D

Simplify the following radical expressions:

1) $\sqrt[4]{81(3x+7)^{16}}$

$\sqrt[4]{81} \cdot \sqrt[4]{(3x+7)^{16}}$

$3 \cdot (3x+7)^4 = \boxed{3(3x+7)^4}$

2) $-\sqrt{363a^8b^5}$

$11 \cdot \sqrt{121 \cdot 3\, a^8 b^5}$

$\boxed{-11a^4b^2\sqrt{3b}}$

3) $\sqrt[3]{128}$

$64 \quad 2$

$\boxed{4\sqrt[3]{2}}$

4) $\sqrt[3]{64(x-4)^9}$

$\boxed{4(x-4)^3}$

5) $\sqrt{196a^4b^3}$

$\boxed{14a^2b\sqrt{b}}$

6) $6\sqrt{72} + 7\sqrt{98} - \sqrt{50}$

$36 \cdot 2 \quad 49 \cdot 2 \quad 25 \cdot 2$

$36\sqrt{2} + 49\sqrt{2} - 5\sqrt{2} = \boxed{80\sqrt{2}}$

7) $5\sqrt{12} + 2\sqrt{27} - \sqrt{128}$

$4 \cdot 3 \quad 9 \cdot 3 \quad 64 \cdot 2$

$10\sqrt{3} + 6\sqrt{3} - 8\sqrt{2}$

$\boxed{16\sqrt{3} - 8\sqrt{2}}$

8) $3\sqrt{90} + 4\sqrt{20} + \sqrt{162}$

$9 \cdot 10 \quad 4 \cdot 5 \quad 81 \cdot 2$

$\boxed{9\sqrt{10} + 8\sqrt{5} + 9\sqrt{2}}$

9) $9\sqrt{12} + 5\sqrt{32} - \sqrt{72}$

$4 \cdot 3 \quad 16 \cdot 2 \quad 36 \cdot 2$

$18\sqrt{3} + 20\sqrt{2} - 6\sqrt{2}$

$\boxed{18\sqrt{3} + 14\sqrt{2}}$

10) $5\sqrt[3]{-12ab^4} \times 3\sqrt[3]{18a^2b^2}$

$15\sqrt[3]{-216a^3b^6}$

$15 \cdot (-6)ab^2$

$\boxed{-90ab^2}$

11) $(6\sqrt{5} + 2\sqrt{2})(3\sqrt{5} + 2\sqrt{2})$

$18 \cdot 5 + 12\sqrt{10} + 6\sqrt{10} + 4 \cdot 2$

$90 + 12\sqrt{10} + 6\sqrt{10} + 8$

$\boxed{98 + 18\sqrt{10}}$

12) $\dfrac{\sqrt{6m^5}}{\sqrt{p^{11}}} \cdot \dfrac{\sqrt{p}}{\sqrt{p}} = \dfrac{\sqrt{6m^5p}}{\sqrt{p^{12}}} = \boxed{\dfrac{\sqrt{6m^5p}}{p^6}} = \boxed{\dfrac{m^2\sqrt{6mp}}{p^6}}$

13) $\dfrac{\sqrt[3]{24x^7}}{\sqrt[3]{3x}} = \sqrt[3]{\dfrac{24x^7}{3x}} = \sqrt[3]{8x^6} = \boxed{2x^2}$

Learning Target 6E

14) a. Write the following expression as a rational exponent: $\sqrt[5]{x^7}$

a. $\boxed{x^{7/5}}$

b. Write the following expression as a radical expression: $x^{\frac{9}{5}}$

b. $\boxed{\sqrt[5]{x^9}}$

15) Write the following expression as a radical expression and simplify: $-3125^{-\frac{1}{5}}$ $= -\frac{1}{3125^{1/5}} = \boxed{-\frac{1}{5}}$

16) Write the following expression as a radical expression and simplify: $256^{\frac{3}{8}}$ $= (4^4)^{3/8} = 4(2^8)^{3/8} = 2^3 = \boxed{8}$

17) Simplify the following expression: $\frac{\sqrt[4]{27}}{\sqrt{3}}$ $= \frac{(27)^{1/4}}{(3)^{1/2}} = \frac{(3^3)^{1/4}}{3^{1/2}}$

$= 3^{3/4 - 1/2} = 3^{1/4} = \boxed{\sqrt[4]{3}}$

18) Simplify the following expression: $\sqrt[4]{x} \times \sqrt[9]{x^4}$

$(x^{1/4})(x^{4/9}) = x^{1/4 + 4/9} = x^{9/36 + 16/36} = \boxed{x^{25/36}}$

Learning Target 6F

19) Solve the following equation: $2(6x-3)^{\frac{1}{3}} - 4 = 0$

$+4 \quad +4$

$\frac{2(6x-3)^{1/3}}{2} = \frac{4}{2}$

$(6x-3)^{1/3} = 2$

$6x - 3 = 2^3$

$+3 \quad +3$

$\frac{6x}{6} = \frac{11}{6}$

20) Solve the following equation: $(x-2)^{\frac{1}{2}} - 1 = 5$

$(x-2)^{1/2} = 6$

$x - 2 = 36$

$\boxed{x = 38}$

21) Solve the following inequality: $3 + \sqrt{5x-10} \leq 8$

$\sqrt{5x-10} \leq 5$

$5x - 10 \leq 25$

$5x \leq 35$

$x \leq 7$

$5x - 10 \geq 0$

$5x \geq 10$

$x \geq 2$

$\boxed{2, 7}$

22) Solve the following inequality: $\sqrt{2x+2} + 1 \geq 5$

$\sqrt{2x+2} \geq 4$

$2x + 2 \geq 16$

$2x \geq 14$

$x \geq 7$

$2x + 2 \geq 0$

$2x \geq -2$

$x \geq -1$

$\boxed{[7, \infty)}$