

Algebra II Unit 1 Quiz 1 Review

Name _____

Simplify.

1.) $(-xy)^5 \cdot x^{-4}y^{-4}$

$$-x^5 y^5 \cdot x^{-4} y^{-4}$$

$$-x^{5+(-4)} y^{5+(-4)}$$

$$\boxed{-xy}$$

3.) $(y^2)^5 \cdot (-x^{-1})^3$

$$y^{10} \cdot -x^{-3}$$

$$\boxed{\frac{y^{10}}{-x^3}}$$

2.) $-ba^4 \cdot (a^5 b^{-1})^2$

$$-ba^4 \cdot a^{5(2)} b^{-1(2)}$$

$$-ba^4 \cdot a^{10} b^{-2}$$

$$-a^{4+10} b^{1+(-2)}$$

$$\boxed{\frac{-a^{14}}{b}}$$

4.) $x^3 y^2 \cdot (-yx^3)^{-2}$

$$x^3 y^2 \cdot (-1)^{-2} y^{-2} x^{-6}$$

$$\frac{x^3 y^2}{(-1)^2 y^2 x^6} = x^{3-6} = x^{-3} = \boxed{\frac{1}{x^3}}$$

Perform the indicated operation.

5.) $3\sqrt{27} + 4\sqrt{45} - \sqrt{75}$

$$3\sqrt{3 \cdot 9} + 4\sqrt{3 \cdot 15} - \sqrt{3 \cdot 25}$$

$$\boxed{9\sqrt{3} + 12\sqrt{5} - 5\sqrt{3}}$$

6.) $-\sqrt[3]{16} + 3\sqrt[3]{162} - 3\sqrt[3]{48}$

$$-\sqrt[3]{2 \cdot 2 \cdot 2 \cdot 2} + 3\sqrt[3]{2 \cdot 3 \cdot 3 \cdot 3 \cdot 3} - 3\sqrt[3]{2 \cdot 2 \cdot 2 \cdot 2}$$

$$\boxed{-2\sqrt[3]{2} + 9\sqrt[3]{6} - 6\sqrt[3]{6}}$$

7.) $-3\sqrt{5} - 2\sqrt{45} - 2\sqrt{12}$

$$-3\sqrt{5} - 2\sqrt{3 \cdot 15} - 2\sqrt{4 \cdot 3}$$

$$\boxed{-3\sqrt{5} - 6\sqrt{5} - 4\sqrt{3}}$$

8.) $\sqrt[3]{5x^2y} \cdot \sqrt[3]{75x^4y^2}$

$$\sqrt[3]{5 \cdot 75 \cdot x^2 \cdot x^4 \cdot y \cdot y^2}$$

$$\boxed{5x^2y\sqrt[3]{3}}$$

$$\boxed{-2\sqrt[3]{2} + 3\sqrt[3]{6}}$$

9.) $(\sqrt{2k} + \sqrt{7k})(-7\sqrt{2} + 7\sqrt{7})$

$$-7\sqrt{4k} + 7\sqrt{14k} - 7\sqrt{14k} + 7\sqrt{49k}$$

$$-14\sqrt{k} + 49\sqrt{k} = \boxed{35\sqrt{k}}$$

10.) $(\sqrt{7x} + \sqrt{2x})(-3\sqrt{7} + \sqrt{2})$

$$-3\sqrt{49x} + \sqrt{14x} - 3\sqrt{14x} + \sqrt{4x}$$

$$-21\sqrt{x} - 2\sqrt{14x} + 2\sqrt{x}$$

$$\boxed{-19\sqrt{x} - 2\sqrt{14x}}$$

11.) $\frac{5}{\sqrt{14xy}} \cdot \frac{\sqrt{14xy}}{\sqrt{14xy}} = \frac{\sqrt{70xy}}{\sqrt{196x^2y^2}} = \frac{\sqrt{70xy}}{14xy}$

12.) $\frac{4+\sqrt{5} \cdot (-4-\sqrt{5})}{-4+\sqrt{5} \cdot (-4-\sqrt{5})}$

$$\frac{-16 - 4\sqrt{5} - 4\sqrt{5} - \sqrt{25}}{16 - \sqrt{25}}$$

$$= \frac{-16 - 8\sqrt{5} - 5}{16 - 5}$$

$$= \boxed{\frac{-21 - 8\sqrt{5}}{11}}$$

13.) $\frac{-5-4\sqrt{2} \cdot (-2-5\sqrt{2})}{-2+5\sqrt{2} \cdot (-2-5\sqrt{2})}$

$$\frac{10 + 25\sqrt{2} + 8\sqrt{2} + 20\sqrt{4}}{4 - 25\sqrt{4}}$$

$$= \frac{10 + 33\sqrt{2} + 40}{4 - 50}$$

$$= \boxed{\frac{50 + 33\sqrt{2}}{-46}}$$

Write each expression in radical form.

14.) $(7x)^{\frac{2}{3}} = 7^{2/3} x^{2/3}$

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

$$\sqrt[3]{49x^2}$$

15.) $x^{\frac{3}{2}}$

$$\frac{1}{x^{3/2}} = \frac{1}{\sqrt{x^3}} \cdot \frac{\sqrt{x^3}}{\sqrt{x^3}} = \frac{\sqrt{x^3}}{\sqrt{x^6}} = \frac{x\sqrt{x}}{x^3}$$

$$= \frac{\sqrt{x}}{x^2}$$

Write each expression in exponential form.

16.) $(\sqrt[3]{10n})^5$

$$(10n)^{5/3}$$

17.) $\frac{1}{(\sqrt[3]{6x})^4}$

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

Simplify.

18.) $(27a^3)^{\frac{2}{3}}$

$$27^{2/3} a^{3(2/3)}$$

$$\left(\sqrt[3]{27}\right)^2 a^2$$

$$\left(\sqrt[3]{3 \cdot 3 \cdot 3}\right)^2 a^2$$

$$(3)^2 a^2 = 9a^2$$

19.) $\left(\frac{ab^{\frac{2}{3}}}{x^{\frac{1}{2}}}\right)^{18}$

$$= \frac{a^{18} b^{2/3(18)}}{x^{-1/2(18)}}$$

$$= \frac{a^{18} b^{12}}{x^{-9}}$$

$$= a^{18} b^{12} x^9$$

20.) $\left(3x^{\frac{1}{3}}y^{-6}\right)^6$

$$3^6 x^{\frac{1}{3}(6)} y^{-6(6)}$$

$$729 x^2 y^{-36}$$

$$\frac{729x^2}{y^{36}}$$

21.) $(256n^6)^{\frac{3}{2}}$

$$256^{-3/2} n^{6(-3/2)}$$

$$256^{-3/2} n^{-9}$$

$$\frac{1}{256^{3/2} n^9}$$

$$\frac{1}{(\sqrt{256})^3 n^9} = \frac{1}{(16)^3 n^9} = \frac{1}{4096n^9}$$

22.) $(-a^{-1}b^4 \cdot a^{-5}b^4)^2$

$$(-a^{-1+(-5)} b^4)^2$$

$$(-a^{-6} b^4)^2$$

$$(-1)^2 a^{-6(2)} b^{4(2)}$$

$$a^{-12} b^8$$

$$\frac{b^8}{a^{12}}$$