Name ______________________

Period ____________

Module 1 Review

Date ______________________

Simplify each radical.

1. $\frac{2}{3}\sqrt{-72}$

$36 \cdot 2$

$6 \cdot 6$

$\boxed{4i\sqrt{2}}$

2. $2i\sqrt{-25}$

$2i(5i)$

$10i^2$

$\boxed{-10}$

3. $\sqrt[3]{-64x^8}$

$4 \cdot 16$

$4 \cdot 4$

$\boxed{-4x^2(\sqrt[3]{x^2})}$

Solve each equation for x.

4. $\frac{4}{5}x^2 = -100$

$\sqrt{x^2} = \sqrt{-125}$ $< \frac{25}{5}$ $\frac{5}{5}$

$\boxed{x = \pm 5i\sqrt{5}}$

5. $-32 = 2x^2 - 4$

$-28 = 2x^2$

$\sqrt{-14} = \sqrt{x^2}$

$\boxed{x = \pm i\sqrt{14}}$

Find the values of x and y that make each equation true.

6. $2(x-9) - (3y)i = 27 + 57i$

$2x - 18 = 27$

$2x = 45$

$\boxed{x = 22.5}$

$-3y = 57$

$\boxed{y = -19}$

7. $8yi + 4(3-x) = 2(3-4i)$

$8yi + 12 - 4x = 6 - 8i$

$12 - 4x = 6$

$-4x = -6$

$\boxed{x = 3/2}$

$8y = -8$

$\boxed{y = -1}$

Simplify the following.

8. $-3i^{10}$

$-3(-1)$

$\boxed{3}$

9. $3 + i^7 - 2i^8$

$3 + (-i) - 2(1)$

$3 - i - 2$

$\boxed{1-i}$

10. $6i^{25} + 4i^{55}$

$6(i) + 4(-i)$

$6i - 4i = \boxed{2i}$

Simplify.

11. $(6-i)-3(5-4i)$

$6-i-15+12i$

$\boxed{-9+11i}$

12. $(-6+9i)(8+2i)^2$

$(-6+9i)(8+2i)(8+2i)$

$-48-12i+72i+18i^2$

$(-66+60i)(8+2i)$

$-528-132i+480i+120i^2$

$\boxed{-648+348i}$

13. $2(7i-6)+i(-14-27i)$

$\cancel{14i}-12\ \cancel{-14i}+27i^2$

$\boxed{15}$

14. $\frac{2i}{-5-3i}$ $\frac{(-5+3i)}{(-5+3i)}=\frac{-10i+6i^2}{25-15i+15i+9i^2}$

$=\frac{-6-10i}{34}$

$=\boxed{\frac{-3-5i}{17}}$

15. $\frac{-3-2i}{6+7i}$ $\frac{(6-7i)}{(6-7i)}=\frac{-18+21i-12i+14i^2}{36-42i+42i+49i^2}$

$=\boxed{\frac{-32+9i}{85}}$

16. $\frac{5-i}{8i}\cdot\frac{-8i}{-8i}=\frac{-40i+8i^2}{+64i^2}$

$=\frac{-8-40i}{64}=\boxed{\frac{-1-5i}{8}}$

17. $\sqrt[4]{128x^8y^{21}}$

2 64

8 8

4 2 4 2

2 2 2 2

$\boxed{2x^2y^5(\sqrt[4]{8y})}$

18. $\sqrt[3]{\frac{40}{125p^{15}}}=\frac{\sqrt[3]{40}}{\sqrt[3]{125p^{15}}}=\boxed{\frac{2\sqrt[3]{5}}{5p^5}}$

5 25

5 5

40

8 5

2 4

2 2

19. $\frac{27^{\frac{2}{3}}}{27^{\frac{7}{3}}}$ $= \frac{1}{27^{5/3}}$

$= \frac{1}{(\sqrt[3]{27})^5} = \frac{1}{3^5} = \boxed{\frac{1}{243}}$

20. $\sqrt[5]{t^{10}} \cdot (s^8 t^{20})^{\frac{3}{4}}$

$= t^2 \cdot s^6 \cdot t^{15}$

$= \boxed{s^6 t^{17}}$

21. $\frac{\sqrt[4]{x^5}}{x}$ $\frac{\cancel{x}\sqrt[4]{x}}{\cancel{x}} = \boxed{\sqrt[4]{x}}$

$\downarrow$

or $\frac{x^{5/4}}{x^{4/4}} = x^{1/4} = \sqrt[4]{x}$

22. $x^{\frac{5}{6}} \cdot x^{\frac{7}{4}} \cdot x^2$

$x^{\frac{10}{12}} \cdot x^{\frac{21}{12}} \cdot x^{\frac{24}{12}} = \boxed{x^{\frac{55}{12}}}$

OR $(\sqrt[12]{x})^{55}$

23. $\sqrt{\frac{27y^5}{2}}$ $\frac{\sqrt{27y^5}}{\sqrt{2}} \cdot \frac{\sqrt{2}}{\sqrt{2}} = \frac{\sqrt{54y^5}}{2}$

54
9 6
3 3

$= \boxed{\frac{3y^2\sqrt{6y}}{2}}$

24. $(-64)^{\frac{-2}{3}}$ $= (\sqrt[3]{-64})^{-2}$

$= (-4)^{-2} = \frac{1}{(-4)^2} = \boxed{\frac{1}{16}}$

25. $\sqrt{-50t^{42}}$ $\boxed{5it^{21}\sqrt{2}}$

25 2
5 5

26. $\frac{100^{\frac{7}{8}}}{\sqrt[8]{100^3}}$ $= \frac{100^{7/8}}{100^{3/8}} = 100^{4/8} = 100^{1/2}$

$= \sqrt{100} = \boxed{10}$

27. $\sqrt[3]{\frac{15x^5}{12x}}$ $= \frac{\sqrt[3]{5x^4}}{\sqrt[3]{4}} \cdot \frac{\sqrt[3]{2}}{\sqrt[3]{2}}$

$= \frac{\sqrt[3]{10x^4}}{2} = \boxed{\frac{x\sqrt[3]{10x}}{2}}$

28. $\sqrt[3]{\frac{5x}{6x^5}}$ $= \frac{\sqrt[3]{5}}{\sqrt[3]{6x^4}} \cdot \frac{\sqrt[3]{36x^2}}{\sqrt[3]{36x^2}} = \boxed{\frac{\sqrt[3]{180x^2}}{6x^2}}$