MTH-100 Review for Test 3 Luczak

SHOW ALL WORK.

Assume all variables represent positive values.
Simplify the following. Do not leave negative exponents.

1. $\dfrac{(xy)^3}{\left(x^4y^5\right)^2} =$

2. $\left(\dfrac{4}{9}\right)^{\frac{1}{2}} =$

3. $\dfrac{\left(27x^6\right)^{\frac{1}{3}}}{x^{-3}} =$

4. $\left(\dfrac{x^2y^3}{2y^{-1}}\right)^2 =$

5. $\left(81x^8\right)^{\frac{1}{4}}\left(16x^{10}\right)^{\frac{1}{2}} =$

6. $\dfrac{x^{\frac{1}{2}}x^{-\frac{1}{3}}}{x^{-\frac{3}{2}}} =$

7. Write in radical form: $-8\left(x^2y\right)^{\frac{2}{3}} =$

8. Write in rational exponent form: $3\sqrt[5]{x^2} =$

Simplify the following. Assume all variables represent positive real numbers. Leave all answers in simplest radical form.

9. $\dfrac{x^2}{3y^3}\sqrt[4]{\dfrac{16y^8}{x^{24}}} =$

10. $-m\sqrt[5]{3^6m^7n^{12}} =$

11. $\sqrt{\dfrac{3x^3}{18x^5y^4}} =$

12. $\sqrt[3]{16x^{10}y^{18}} =$

13. $\left(\sqrt[3]{16xy^2}\right)\left(\sqrt[3]{-x^2y^4}\right) =$

14. $\dfrac{3x}{\sqrt{xy}} =$

15. $\dfrac{2}{\sqrt[3]{xy^2}} =$

Perform the indicated operations. Leave answer in simplest radical form.

16. $\sqrt[3]{3x^2y}\left(\sqrt[3]{9xy^2} + \sqrt[3]{xy}\right) =$

17. $\left(\sqrt{4x} - \sqrt{9y}\right)^2 =$

18. $\left(\sqrt{5y}-\sqrt{3x}\right)\left(\sqrt{5y}+\sqrt{3x}\right)=$

19. $\dfrac{\sqrt{x}}{\sqrt{x}-2}=$

20. $\dfrac{2\sqrt{x}+3\sqrt{y}}{4\sqrt{x}+5\sqrt{y}}=$

21. Solve the following equations:

a) $\sqrt{x+3}=x-3$ b) $\sqrt{x+28}=\sqrt{x}+2$ c) $\sqrt[4]{x+3}+9=0$ d) $\sqrt[3]{5x+2}=3$

22. Simplify: $\sqrt{-81}$

23. Simplify: $\sqrt{-98}$

Perform the indicated operations on the following complex numbers. Leave answer in $a+bi$ form.

24. $\sqrt{-16}\sqrt{-25}$

25. $(-8-\sqrt{-9})+(2-\sqrt{-64})$

26. $(5+\sqrt{-9})(2-\sqrt{-49})=$

27. $\dfrac{1}{2i}$

28. $\dfrac{15-3i}{2-3i}=$

29. $(-3-7i)(1+2i)$

30. $(-3+2i)-(-3-2i)$

31. Write as $1, -1, i,$ or $-i$: i^{97}

32. Show by multiplying out why $(a+bi)(a-bi)=a^2+b^2$