R2 Day 2

This entire assignment is NO CALC – unless otherwise specified.

(1-2) Change to radical form. *Do not simplify.*

1. $625^{\frac{3}{4}}$

$\sqrt[4]{625^3}$

2. $x^{\frac{1}{3}} - y^{\frac{1}{3}}$

$\sqrt[3]{x} - \sqrt[3]{y}$

(3-5) Change to exponential form. *Do not simplify.*

3. $\sqrt{3}$

$3^{1/2}$

4. $\sqrt[3]{13^4}$

$13^{4/3}$

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

$4x\,y^{3/5}$

(6-16) Evaluate each expression over the ***real numbers***.

6. $\sqrt[3]{-27}$

-3

7. $\sqrt[3]{64}$

4

8. $\sqrt[4]{-16}$

Not defined

9. $9^{-\frac{3}{2}}$

$= \left(\left(9^{1/2}\right)^3\right)^{-1}$

$= \frac{1}{27}$

10. $64^{-\frac{4}{3}}$

$= \frac{1}{256}$

11. $\left(\frac{1}{81}\right)^{\frac{1}{4}}$

$= \frac{1}{3}$

12. $256^{\frac{3}{4}}$

64

13. $(-64)^{\frac{2}{3}}$

$\left((-64)^{1/3}\right)^2$

$= 16$

14. $-64^{\frac{2}{3}}$

$-1 \cdot 64^{2/3}$

$= -1 \cdot 16$

$= -16$

15. $\left(\frac{9}{100}\right)^{\frac{3}{2}}$

$= \left(\frac{3}{10}\right)^3$

$= \frac{27}{100}$

16. $\sqrt[6]{-1}$

Not defined

(17-18) Use your calculator . Find the radical: **Math → 5** *On the old calcs:* $\sqrt[4]{16}$ *would look like* $4*\sqrt{(16)}$ *:*
Round to the nearest hundredth if necessary.

17. $\sqrt[5]{7776}$

6

18. $\sqrt[6]{4000}$

3.98

(19-20) Estimate *(without a calc)* what two integers the expression is between.

19. $\sqrt[3]{40}$

$\sqrt[3]{27} < \sqrt[3]{40} < \sqrt[3]{64}$

Between 3 & 4

20. $\sqrt[5]{30}$

$\sqrt[5]{1} < \sqrt[5]{30} < \sqrt[5]{32}$

Between 1 & 2

(21-22) Simplify the expression. Assume all variables are positive.

21. $\sqrt{192x^6y^9z}$

$= \sqrt{64 \cdot 3 \cdot x^6 \cdot y^8 \cdot y \cdot z}$

$= 8x^3y^4\sqrt{3yz}$

22. $\sqrt[4]{16m^4n^8}$

$= \sqrt[4]{2^4 m^4 n^8}$

$= 2mn^2$

23. $\sqrt[3]{54x^9y^5}$

$= \sqrt[3]{27 \cdot 2 \cdot x^9 \cdot y^3 \cdot y^2}$

$= 3x^3y^1\sqrt[3]{2y^2}$

24. $2\sqrt{8} + \sqrt{18}$

$= 2\sqrt{4 \cdot 2} + \sqrt{9 \cdot 2}$

$= 2 \cdot 2\sqrt{2} + 3\sqrt{2}$

$= 7\sqrt{2}$

25. $\sqrt{20} + \sqrt[3]{40} - \sqrt[3]{5}$

$= \sqrt{4 \cdot 5} + \sqrt[3]{8 \cdot 5} - \sqrt[3]{5}$

$= 2\sqrt{5} + 2\sqrt[3]{5} - \sqrt[3]{5}$

$= 2\sqrt{5} + \sqrt[3]{5}$

26. $\sqrt[4]{32} + 3\sqrt[3]{3} - \sqrt[4]{2} + 2\sqrt[3]{81}$

$\sqrt[4]{16 \cdot 2} + 3\sqrt[3]{3} - \sqrt[4]{2} + 2\sqrt[3]{27 \cdot 3}$

$= 2\sqrt[4]{2} + 3\sqrt[3]{3} - \sqrt[4]{2} + 6\sqrt[3]{3}$

$= \sqrt[4]{2} + 9\sqrt[3]{3}$

27. $\dfrac{2\sqrt{2}x^2}{\sqrt{3}} \cdot \dfrac{\sqrt{3}}{\sqrt{3}}$

$= \dfrac{2\sqrt{6} \cdot x^2}{3}$

28. $\dfrac{6}{2-\sqrt{5}} \cdot \dfrac{2+\sqrt{5}}{2+\sqrt{5}}$

$= \dfrac{12 + 6\sqrt{5}}{4 + 2\sqrt{5} - 2\sqrt{5} - \sqrt{25}}$

$= \dfrac{12 + 6\sqrt{5}}{-1} = -12 - 6\sqrt{5}$