

Master E

1-8: Evaluate each of the following without using a calculator (use your power card).			
1. $243^{3/5}$ $(\sqrt[5]{243})^3$ $(3)^3 = 27$	2. $(-1024)^{3/5}$ $(\sqrt[5]{-1024})^3$ $(-4)^3 = -64$	3. $(-512)^{2/3}$ $(\sqrt[3]{-512})^2$ $(-8)^2 = 64$	4. $(\sqrt[4]{625})^5$ $(5)^5 = 3125$
5. $36^{3/2}$ $(\sqrt{36})^3$ $(6)^3 = 216$	6. $(-216)^{4/3}$ $(\sqrt[3]{-216})^4$ $(-6)^4 = 1296$	7. $(3125)^{2/5}$ $(\sqrt[5]{3125})^2$ $(5)^2 = 25$	8. $32^{2/5}$ $(\sqrt[5]{32})^2$ $(2)^2 = 4$
9-16: Rewrite each expression using rational exponents.			
9. $\sqrt[3]{26}$ $26^{1/3}$	10. $\sqrt{36x^5y^6}$ $6x^{5/2}y^3$ $(6x^{5/2}y^3)$	11. $\sqrt[10]{x^6}$ $x^{6/10} = x^{3/5}$	12. $3\sqrt[4]{27n^{10}w}$ $3 \cdot 3^{3/4} n^{10/4} w^{1/4}$ $3^{7/4} n^{5/2} w^{1/4}$
13. $\sqrt[4]{10^3}$ $10^{3/4}$	14. $\sqrt{3ab}$ $3^{1/2} a^{1/2} b^{1/2}$	15. $(\sqrt[3]{2w})^5 (2w)^{5/3}$ $2^{5/3} w^{5/3}$	16. $\sqrt[4]{18x^9y^{12}}$ $18^{1/4} x^{9/4} y^{3}$ $18^{1/4} x^{9/4} y^{1/2}$
17-40: Simplify each expression. Put irrational answers in simplest radical form.			
17. $2^{5/7} a^{3/7} y^{9/7}$ $\sqrt[7]{2^5 a^3 y^9}$ $\sqrt[7]{32 a^3 y^9}$ $y \sqrt[7]{32 a^3 y^2}$	18. $a^{2/3} g^{1/4} e^{1/2}$ $a^{8/12} g^{3/12} e^{6/12}$ $\sqrt[12]{a^8 g^3 e^6}$	19. $m^{1/3} v^{3/4} z^{5/6}$ $m^{4/12} v^{9/12} z^{10/12}$ $\sqrt[12]{m^4 v^9 z^{10}}$	20. $\frac{y^{2/3}}{y^{1/3}} = y^{2/3 - 1/3}$ $y^{1/3}$ $\sqrt[3]{y}$
21. $z^{2/3} \cdot z^{1/2}$ $z^{2/3 + 1/2}$ $z^{4/6 + 3/6}$ $z^{7/6} = \sqrt[6]{z^7}$ $\sqrt[6]{z^6 \cdot z}$ $z \sqrt{z}$	22. $\sqrt[3]{16} \cdot \sqrt[3]{4}$ $\sqrt[3]{24} \cdot \sqrt[3]{2^2}$ $= \sqrt[3]{2^6} = 2^{6/3}$ $= 2^2 = 4$	23. $\frac{\sqrt[4]{32}}{\sqrt{2}} = \frac{4\sqrt[4]{2}}{\sqrt{2}}$ $4\sqrt[4]{16} = 4\sqrt{2}$ $= 2$	24. $\frac{\sqrt[3]{250}}{\sqrt[3]{2}} = \sqrt[3]{\frac{250}{2}}$ $\sqrt[3]{125}$ $\sqrt[3]{5^3}$ $5$

<p>25. <math>\sqrt[4]{\frac{2}{9}}</math></p> $\frac{\sqrt[4]{2}}{\sqrt[4]{3^2}} \cdot \frac{\sqrt[4]{3^2}}{\sqrt[4]{3^2}} = \frac{\sqrt[4]{18}}{\sqrt[4]{3^4}}$ $\frac{\sqrt[4]{18}}{3}$	<p>26. <math>\sqrt[4]{256x^8y}</math></p> $\sqrt[4]{4^4x^8y}$ $\sqrt[4]{4x^2 \cdot 4y}$	<p>27. <math>\sqrt{\frac{4x^2y}{9z^2}}</math></p> $\frac{2x\sqrt{y}}{3z}$	<p>28. <math>\sqrt[5]{96} - 4\sqrt[5]{3}</math></p> $\sqrt[5]{32 \cdot 3} - 4\sqrt[5]{3}$ $\sqrt[5]{2^5 \cdot 3} - 4\sqrt[5]{3}$ $2\sqrt[5]{3} - 4\sqrt[5]{3}$ $-2\sqrt[5]{3}$
<p>29. <math>2\sqrt[5]{3} - \sqrt[5]{3}</math></p> $\sqrt[5]{3}$	<p>30. <math>7(2^{1/8}) + 4(2^{1/8})</math></p> $7\sqrt[8]{2} + 4\sqrt[8]{2}$ $11\sqrt[8]{2}$	<p>31. <math>\sqrt[3]{40} + \sqrt[3]{5}</math></p> $\sqrt[3]{8 \cdot 5} + \sqrt[3]{5}$ $\sqrt[3]{2^3 \cdot 5} + \sqrt[3]{5}$ $2\sqrt[3]{5} + \sqrt[3]{5}$ $3\sqrt[3]{5}$	<p>32. <math>\frac{1}{64^{1/3}}</math></p> $64^{1/3} = \sqrt[3]{64}$ $= \sqrt[3]{4^3} = 4$
<p>33. <math>4\sqrt{2} - \sqrt{8}</math></p> $4\sqrt{2} - \sqrt{4 \cdot 2}$ $4\sqrt{2} - 2\sqrt{2}$ $2\sqrt{2}$	<p>34. <math>\left(\frac{3^{1/2}}{12^{1/2}}\right)^3</math></p> $\frac{3^{3/2}}{12^{3/2}} = \left(\frac{3}{12}\right)^{3/2}$ $\left(\frac{1}{4}\right)^{3/2} = \left(\sqrt{\frac{1}{4}}\right)^3$ $\left(\frac{1}{2}\right)^3 = \frac{1}{8}$	<p>35. <math>\left(28^{3/5}\right)^{5/6}</math></p> $28^{3/5 \cdot 5/6}$ $28^{1/2}$ $\sqrt{28}$ $\sqrt{4 \cdot 7} = 2\sqrt{7}$	<p>36. <math>\frac{\sqrt[3]{24^4}}{24}</math></p> $\frac{\sqrt[3]{24^3 \cdot 24}}{24}$ $\frac{24 \sqrt[3]{24}}{24}$ $\sqrt[3]{24} = \sqrt[3]{8 \cdot 3}$ $2\sqrt[3]{3}$
<p>37. <math>\sqrt[4]{a^2b^{14}}</math></p> $\sqrt[4]{a^2b^{12}b^2}$ $b^3 \sqrt[4]{a^2b^2}$ $a^{2/4} b^{2/4}$ <p>BEST <math>b^3 \sqrt{ab}</math></p>	<p>38. <math>\sqrt[3]{-72a^9b^2}</math></p> $\sqrt[3]{-8 \cdot 9 \cdot a^9 b^2}$ $-2a^3 \sqrt[3]{9b^2}$	<p>39. <math>\sqrt[3]{-6x^5} \cdot \sqrt[3]{18x^4}</math></p> $\sqrt[3]{-2 \cdot 3 \cdot 3 \cdot 3 \cdot 2 \cdot x^9}$ $-3x^3 \sqrt[3]{4}$	<p>40. <math>3\sqrt[4]{8} \cdot 7\sqrt[4]{32}</math></p> $3 \cdot 7 \sqrt[4]{2^3 \cdot 2^5}$ $21 \sqrt[4]{2^8}$ $21 \cdot 2^2$ $21 \cdot 4 = 84$