Exponents Review

Pertinent Laws of Exponents for this Chapter

$$a^{-n} = \frac{1}{a^n}$$

$$\sqrt[n]{a} = a^{\frac{1}{n}}$$

$$a^{\frac{m}{n}} = \left(a^m\right)^{\frac{1}{n}} = \left(a^{\frac{1}{n}}\right)^m$$

$$\left(a^m\right)^n = a^{mn}$$

Evaluate each of the following

1) $27^{\frac{4}{3}}$

2) $36^{-\frac{3}{2}}$

3) $\left(25^3\right)^{\frac{1}{2}}$

4) $\left(\frac{27}{8}\right)^{-\frac{1}{3}}$

5) $-27^{\frac{2}{3}}$

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

7) $\left(64x^{12}y^{15}\right)^{\frac{1}{3}}$

8) $\sqrt[3]{4^6}$

9) $\left[\left(\frac{16}{49}\right)^3\right]^{\frac{1}{2}}$

10) $3^{\sqrt{2}} \cdot 3^{2\sqrt{2}}$

11) $9^{\frac{\pi}{2}}$

12) $\frac{5^{\sqrt{3}+6}}{125}$

13) $\frac{3^{\sqrt{3}} \cdot 3^{\sqrt{27}}}{3^{2\sqrt{3}}}$

14) $\frac{32^{\sqrt{7}}}{4^{\sqrt{7}}}$

15) $\left(\sqrt{2}\right)^{\sqrt{3}} \cdot \left(\sqrt{2}\right)^{-\sqrt{3}}$

16) $\sqrt{\frac{2^{\sqrt{3}+3}}{8}}$

17) $\left(16^{\frac{3\sqrt{2}}{8}}\right)^{\sqrt{2}}$

18) $\frac{\left(\sqrt{5}-1\right)^{2+\pi}}{\left(\sqrt{5}-1\right)^{\pi}}$

Exponential Equations

19) $64^{7x-4} = 2 \cdot 8^{x-1}$

20) $3^{2x-1} = 5x - 4$