Math3 (814013) – Spring 2007

Worksheet 12

Question (1) : Simplify the following:

1) $\sqrt{4}$ 2) $\sqrt[3]{8}$ 3) $\sqrt[4]{16}$

4) $\sqrt[5]{32}$ 5) $\sqrt{8}$ 6) $\sqrt{12}$

7) $\sqrt{72}$ 8) $\sqrt{4}$ 9) $\sqrt[7]{(u^2+v^2)^7}$

10) $\sqrt{6}\sqrt{2}$ 11) $\sqrt[3]{\frac{x^2}{8}}$ 12) $\sqrt[3]{x^6}$

13) $\sqrt{12x^3y^5z^2}$ 14) $\sqrt{18x^5y^2z^3}$ 15) $\sqrt[3]{6x^2y}\cdot\sqrt[3]{4x^5y^2}$

16) $\sqrt[4]{27a^3b^3}\cdot\sqrt[4]{3a^5b^3}$ 17) $\sqrt[6]{16x^4y^2}$ 18) $\sqrt[9]{8x^6y^3}$

19) $\sqrt{\sqrt[3]{4}}$ 20) $\sqrt[3]{\sqrt{27}}$ 21) $\sqrt[5]{32a^{15}b^{10}}$

22) $\sqrt[4]{m^2}$ 23) $\sqrt[3]{\sqrt[4]{\sqrt{x}}}$ 24) $2a\cdot\sqrt[3]{8a^8b^{13}}$

25) $\frac{\sqrt[4]{32m^7n^9}}{2mn}$ 26) $\sqrt[5]{\frac{8x^3}{y^4}}\cdot\sqrt[5]{\frac{4x^2}{y}}$ 27) $\sqrt[4]{(x+2)^{12}y^4}$

Question (2) : Simplify (combine) the following as much as possible:

1) $7\sqrt{2}+5\sqrt{2}$ 2) $8\sqrt[3]{xy^2}-3\sqrt[3]{xy^2}$

3) $3\sqrt[5]{2x^2y^3}-8\sqrt[5]{2x^2y^3}$ 4) $5\sqrt[3]{mn^2}-3\sqrt{mn}-2\sqrt[3]{mn^2}+7\sqrt{mn}$

5) $3\sqrt{8}-5\sqrt{2}+4\sqrt{18}$ 6) $\sqrt[3]{81}+2\sqrt[3]{24}-4\sqrt[3]{\frac{3}{8}}$

7) $x\sqrt[3]{2xy^2}+4\sqrt[3]{16x^4y^2}-5x\sqrt[6]{4x^2y^4}$ 8) $\sqrt{18}-2\sqrt{12}+5\sqrt{50}-4\sqrt{75}$

Question (3) : Multiply and simplify the following as much as possible:

1) $\sqrt{3}\left(\sqrt{6}-4\right)$ 2) $\left(\sqrt{3}-2\right)\left(\sqrt{3}+4\right)$

3) $\left(\sqrt{y}-2\right)\left(\sqrt{y}+4\right)$ 4) $\left(\sqrt[3]{x^2}-\sqrt[3]{y^2}\right)\left(\sqrt[3]{x}+\sqrt[3]{y}\right)$

5) $\left(\sqrt{y}-2\right)\left(\sqrt{y}+2\right)$ 6) $\left(\sqrt{x}-\sqrt{y}\right)^2$

7) $\left(\sqrt{y}+4\right)\left(\sqrt[3]{y}-3\right)$ 8) $\sqrt{5}\left(\sqrt{10}-4\sqrt{5}+\sqrt{40}\right)$

9) $\left(\sqrt[3]{x}-\sqrt[3]{y}\right)\left(\sqrt[3]{x^2}+\sqrt[3]{x}\cdot\sqrt[3]{y}+\sqrt[3]{y^2}\right)$

Question (4) : Evaluate the following:

1) $\dfrac{0.5}{\sqrt{0.04}}$

2) $\sqrt{\sqrt[3]{125}+\sqrt[3]{64}}$

3) $\sqrt{2\left(2006^2+2007^2\right)-1}$ **Hint:** *write 2007 =2006 + 1*

4) $\sqrt[3]{4^5+4^5+4^5+4^5}$

5) $u=\sqrt{3+\sqrt{8}}-\sqrt{3-\sqrt{8}}$ **Hint:** *square both sides*

6) $\sqrt{2^4+2^4+2^4+2^4}$

7) $\sqrt{2\left(2005^2+2006^2\right)-1}$ **Hint:** *write 2006 =2005 + 1*

8) $\dfrac{0.5}{\sqrt[3]{0.008}}$

Question (5) : Show that $\sqrt[km]{x^{km}}=\sqrt[n]{x^m}$ for k, m and n natural numbers greater than 1.

Question (6) : Show that $\sqrt[m]{\sqrt[n]{x}}=\sqrt[mn]{x}$ for m and n natural numbers greater than 1.

Question (7) : Which is smaller $\dfrac{0.5}{\sqrt{0.04}}$ or $\dfrac{0.5}{\sqrt[3]{0.008}}$.

Question (8) : Write in simplified form: $\sqrt[n+1]{x^{n^2}\cdot x^{2n+1}}$ $n>0$.