MEMORIAL UNIVERSITY OF NEWFOUNDLAND

DEPARTMENT OF MATHEMATICS AND STATISTICS

SECTION 1.6 | **Math 1090 Worksheet** | FALL 2026

SOLUTIONS

1. (a) $6\sqrt{20}-5\sqrt{45}=6\sqrt{4\cdot 5}-5\sqrt{9\cdot 5}=6(2)\sqrt{5}-5(3)\sqrt{5}=12\sqrt{5}-15\sqrt{5}=-3\sqrt{5}$

   (b) $\sqrt[3]{81x^7}=\sqrt[3]{27x^6\cdot 3x}=3x^2\sqrt[3]{3x}$

   (c) $\sqrt{8xy^3}\cdot\sqrt{2xy}=\sqrt{8xy^3\cdot 2xy}=\sqrt{16x^2y^4}=4xy^2$

   (d) $\dfrac{\sqrt[4]{32x}}{\sqrt[4]{2x^5}}=\sqrt[4]{\dfrac{32x}{2x^5}}=\sqrt[4]{\dfrac{16}{x^4}}=\dfrac{2}{x}$

   (e) $\sqrt{27x^2-9x^3}=\sqrt{9x^2(3-x)}=3x\sqrt{3-x}$

   (f) $\sqrt[3]{27\sqrt{64x}}=\sqrt[3]{27\cdot 8\sqrt{x}}=\sqrt[3]{216\sqrt{x}}=6\sqrt[3]{\sqrt{x}}=6\sqrt[6]{x}$

2. (a) $\dfrac{15}{2\sqrt{5}}\cdot\dfrac{\sqrt{5}}{\sqrt{5}}=\dfrac{15\sqrt{5}}{2\cdot 5}=\dfrac{3\sqrt{5}}{2}$

   (b) $\dfrac{3}{6-4\sqrt{3}}\cdot\dfrac{6+4\sqrt{3}}{6+4\sqrt{3}}=\dfrac{3(6+4\sqrt{3})}{36-48}=\dfrac{3(6+4\sqrt{3})}{-12}=\dfrac{6(3+2\sqrt{3})}{-12}=-\dfrac{3+2\sqrt{3}}{2}$

   (c) $\dfrac{1}{\sqrt{7}+3\sqrt{2}}\cdot\dfrac{\sqrt{7}-3\sqrt{2}}{\sqrt{7}-3\sqrt{2}}=\dfrac{\sqrt{7}-3\sqrt{2}}{7-18}=-\dfrac{\sqrt{7}-3\sqrt{2}}{11}$

3. (a) $25^{\frac{3}{2}}=\left(\sqrt{25}\right)^3=5^3=125$

   (b) $(-8)^{\frac{5}{3}}=\left(\sqrt[3]{-8}\right)^5=(-2)^5=-32$

   (c) $(-16)^{\frac{7}{4}}=\left(\sqrt[4]{-16}\right)^7$ is undefined (we cannot take a fourth root of a negative number)

   (d) $81^{-\frac{3}{4}}=\dfrac{1}{81^{\frac{3}{4}}}=\dfrac{1}{\left(\sqrt[4]{81}\right)^3}=\dfrac{1}{3^3}=\dfrac{1}{27}$

   (e) $\left(\dfrac{1}{125}\right)^{\frac{2}{3}}=\dfrac{1}{125^{\frac{2}{3}}}=\dfrac{1}{\left(\sqrt[3]{125}\right)^2}=\dfrac{1}{5^2}=\dfrac{1}{25}$

   (f) $\left(\dfrac{49}{9}\right)^{-\frac{3}{2}}=\left(\dfrac{9}{49}\right)^{\frac{3}{2}}=\left(\sqrt{\dfrac{9}{49}}\right)^3=\left(\dfrac{3}{7}\right)^3=\dfrac{27}{343}$