Nineteenth Set of Homework for Math 05

Nikos Apostolakis

Please note: You should fully justify your answers.

1 Radical expressions

1. Simplify each of the following radical expressions:
    (a) $\sqrt{125}$
    (b) $\sqrt{72}$
    (c) $\sqrt{98}$
    (d) $\sqrt{600}$
    (e) $\sqrt{48}$
    (f) $\sqrt{-4}$
    (g) $\sqrt{-50}$
    (h) $\sqrt[3]{-8}$
    (i) $\sqrt[3]{56}$
    (j) $\sqrt[3]{\dfrac{9}{64}}$
    (k) $\sqrt{\dfrac{1}{5}}$
    (l) $\sqrt{\dfrac{2}{3}}$
    (m) $\dfrac{\sqrt{12}}{\sqrt{32}}$

2. Simplify each of the following radical expressions:
    (a) $3\sqrt{8} - \sqrt{18} + 5\sqrt{52}$
    (b) $-4\sqrt{27} + \sqrt{75} - \sqrt{6}$
    (c) $2\sqrt{28} - 3\sqrt{63} - \sqrt{44} + 5\sqrt{99}$

3. Simplify each of the following radical expressions:
    (a) $\sqrt{3}\left(\sqrt{7} + \sqrt{5}\right)$
    (b) $\sqrt{2}\left(\sqrt{10} + \sqrt{7}\right)$
    (c) $\left(\sqrt{3} - \sqrt{5}\right)\left(\sqrt{5} + \sqrt{21}\right)$
    (d) $\left(\sqrt{7} - \sqrt{2}\right)\left(\sqrt{7} + \sqrt{2}\right)$
    (e) $\left(\sqrt{3} - \sqrt{2}\right)^2$
    (f) $\left(\sqrt{5} + \sqrt{15}\right)^2$

4. Evaluate each of the following expressions for the given value of the variables:
    (a) $\sqrt{3x - 2}$ when $x = 6$
    (b) $\sqrt{2x - 6}$ when $x = -7$

(c) $\sqrt{x^2 - 4xy}$ when $x = -1$ and $y = 6$

(d) $\sqrt{x^2 - y^2}$ when $x = -5$ and $y = -4$

(e) $\sqrt{x^2 + x + 10}$ when $x = 6$

(f) $\sqrt{5 - x^2}$ when $x = -5$

(g) $\sqrt{-2xy}$ when $x = -4$ and $y = 50$