

## Sixth Set of Homework

Nikos Apostolakis

**Due: Tuesday February 22**

**Please note:** You should fully justify your answers.

### 1 Radical expressions

1. 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  $y = 50$

2. Simplify each of the following radical expressions:

- (a)  $\sqrt{(-5)^2}$
- (b)  $\sqrt{125}$
- (c)  $\sqrt{72}$
- (d)  $\sqrt{98}$
- (e)  $\sqrt{600}$
- (f)  $\sqrt{48}$
- (g)  $\sqrt{-4}$
- (h)  $\sqrt{-50}$
- (i)  $\frac{2}{\sqrt{5}}$
- (j)  $\frac{3}{\sqrt{3}}$
- (k)  $\frac{\sqrt{3}}{\sqrt{5}}$
- (l)  $\sqrt{\frac{1}{5}}$
- (m)  $\sqrt{\frac{2}{3}}$
- (n)  $\sqrt[3]{-8}$
- (o)  $\sqrt[3]{56}$
- (p)  $\sqrt[3]{\frac{9}{64}}$
- (q)  $\frac{\sqrt{12}}{\sqrt{32}}$

3. Simplify each of the following radical expressions:

(a)  $5\sqrt{3} - 7\sqrt{2} + 3\sqrt{3}$

(b)  $\sqrt{7} + \sqrt{8}$

(c)  $7\sqrt{72} - 6\sqrt{98}$

(d)  $3\sqrt{8} - \sqrt{18} + 5\sqrt{52}$

(e)  $-4\sqrt{27} + \sqrt{75} - \sqrt{6}$

(f)  $2\sqrt{28} - 3\sqrt{63} - \sqrt{44} + 5\sqrt{99}$

4. Simplify each of the following radical expressions:

(a)  $\sqrt{3} \cdot \sqrt{6}$

(b)  $(5\sqrt{7})^2$

(c)  $(\sqrt{5})^3$

(d)  $(3\sqrt{2})^2$

(e)  $(1 - 2\sqrt{5})^2$

(f)  $\sqrt{3}(\sqrt{7} + \sqrt{5})$

(g)  $\sqrt{2}(\sqrt{10} + \sqrt{7})$

(h)  $(\sqrt{3} - \sqrt{5})(\sqrt{5} + \sqrt{21})$

(i)  $(\sqrt{7} - \sqrt{2})(\sqrt{7} + \sqrt{2})$

(j)  $(\sqrt{3} - \sqrt{2})^2$

(k)  $(\sqrt{5} + \sqrt{15})^2$

(l)  $(2 - \sqrt{5})(2 + \sqrt{5})$

(m)  $(1 + 3\sqrt{2})(1 - 3\sqrt{2})$

(n)  $(1 + \sqrt{2} + \sqrt{3})(2 + \sqrt{2} - \sqrt{6})$