

Facit til kursusgang 4: Rødder

1. Svarene er:

$$2, \quad 5, \quad \frac{1}{9}, \quad 3, \quad 4, \quad 100.$$

2. Svarene er:

$$\frac{\sqrt{2}}{2}, \quad \sqrt{2}, \quad \sqrt{2}, \quad 3\sqrt{3}, \quad \frac{1}{2}, \quad 7^{2/3}.$$

3. Svarene er:

$$4, \quad 9, \quad \sqrt{8} = \sqrt{4 \cdot 2} = \sqrt{4}\sqrt{2} = 2\sqrt{2}, \quad 100000, \quad -5.$$

4. Svarene er:

$$x^{4/3}, \quad x^{-1/6}, \quad 2^{-3/4}x^{1/8}, \quad x^{-1/2}, \quad x^{5/2}.$$

5. Svarene er:

$$2\sqrt{x}, \quad \sqrt{3}, \quad \sqrt{7}, \quad \frac{2\sqrt{xy}}{x+y+2\sqrt{xy}}$$

Svaret i 5d) kan fås ved følgende udregninger:

$$\begin{aligned} & \frac{\sqrt{x} - \sqrt{y}}{\sqrt{x} + \sqrt{y}} \cdot \frac{2\sqrt{xy}}{x - y} = \\ & \left(\frac{\sqrt{x} - \sqrt{y}}{(\sqrt{x} + \sqrt{y})(\sqrt{x} + \sqrt{y})} \right) \cdot \frac{2\sqrt{xy}}{x - y} = \\ & \frac{x - y}{x + \sqrt{xy} + \sqrt{xy} + y} \cdot \frac{2\sqrt{xy}}{x - y} = \\ & \frac{2\sqrt{xy}}{x + y + 2\sqrt{xy}} \end{aligned}$$

6. Svarene er:

$$\sqrt{2} + 2, \quad 9\sqrt{2} - 4, \quad 1.$$

7. Svarene er:

$$a^{11/12}b^{4/3}, \quad a^{-1/4}, \quad a^{-3}.$$

8. Ved at anvende en kvadratsætning fås

$$(1 + \sqrt{3})^2 = 1 + 3 + 2\sqrt{3} = 4 + 2\sqrt{3},$$

og fra definitionen af kvadratroden følger at

$$1 + \sqrt{3} = \sqrt{4 + 2\sqrt{3}}$$

9. Svarene er:

$$\frac{\sqrt{7}(\sqrt{2} + 6)}{3}, \quad \frac{(1 - \sqrt{3})^2}{\sqrt{2}(1 - \sqrt{3})} = \frac{\sqrt{2} - \sqrt{6}}{2}, \quad 24.$$