Mixed Exercise 1

15) $\quad y = \frac{1}{64}x^3$

a) $\quad y^{\frac{1}{3}} = \left(\frac{x^3}{64}\right)^{\frac{1}{3}}$

$\qquad\qquad = \frac{x}{4}$

b) $\quad 4y^{-1} = \frac{4}{\frac{1}{64}x^3}$

$\qquad\qquad = \frac{4}{\frac{x^3}{64}}$

$\qquad\qquad = 4 \times \frac{64}{x^3}$

$\qquad\qquad = \frac{256}{x^3} \quad = 256x^{-3}$

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17) $\quad \left(\sqrt{11} - 5\right)\left(5 - \sqrt{11}\right)$

$\quad = \quad 5\sqrt{11} - 25 - 11 + 5\sqrt{11}$

$\quad = \quad 10\sqrt{11} - 36$

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19) $\quad 27^{2x+1} \quad = \quad \left(3^3\right)^{2x+1} = 3^{6x+3}$

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21) $\quad$ width $= \frac{\text{Area}}{\text{Length}} \quad = \quad \frac{\sqrt{12}}{1 + \sqrt{3}}$

$$= \frac{\sqrt{4 \times 3}}{1 + \sqrt{3}} \times \frac{1 - \sqrt{3}}{1 - \sqrt{3}}$$

$$= \frac{2\sqrt{3}(1 - \sqrt{3})}{1^2 - \sqrt{3}^2}$$

$$= \frac{2\sqrt{3} - 6}{1 - 3}$$

$$= \frac{2(\sqrt{3} - 3)}{-2}$$

$$= 3 - \sqrt{3}$$

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23) $243\sqrt{3} = 3^a$ find a

$3^5 \times 3^{\frac{1}{2}} = 3^{\frac{11}{2}}$ $a = \frac{11}{2}$

7b) $x^3 - 36x = x(x^2 - 36)$

$= x(x + 6)(x - 6)$

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18) $x - 64x^3$

$x(1 - 64x^2)$

$x(1 + 8x)(1 - 8x)$

20)

$$8 + x\sqrt{12} = \frac{8x}{\sqrt{3}}$$

$$8\sqrt{3} + x\sqrt{36} = 8x$$

$$8\sqrt{3} = 8x - 6x$$

$$8\sqrt{3} = 2x$$

$$4\sqrt{3} = x \qquad\qquad x = 4\sqrt{3}$$

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22)

$$\frac{(2-\sqrt{x})^2}{\sqrt{x}} = \frac{4 - 4\sqrt{x} + x}{\sqrt{x}}$$

$$= \frac{4}{\sqrt{x}} - \frac{4\sqrt{x}}{\sqrt{x}} + \frac{x}{\sqrt{x}}$$

$$= 4x^{-\frac{1}{2}} - 4 + x^{\frac{1}{2}}$$

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24)

$$\frac{4x^3 + x^{5/2}}{\sqrt{x}} \qquad \frac{4x^3}{x^{\frac{1}{2}}} + \frac{x^{5/2}}{x^{\frac{1}{2}}}$$

$$= 4x^{5/2} + x^2$$