

5.3 Day 2 pgs 301-302 9, 11-19

9 a) $\sqrt{2k} = \sqrt{8}$ check $\sqrt{8} = \sqrt{8} \checkmark$
 $2k = 8$ $\therefore \boxed{k=4}$
 $k = 4$

b) $\sqrt{-3m} = -\sqrt{-7m}$ check $\sqrt{0} = \sqrt{0} \checkmark$
 $-3m = -7m$
 $4m = 0$ $\therefore \boxed{m=0}$
 $m = 0$

c) $5\sqrt{\frac{j}{2}} = \sqrt{200}$ check $5\sqrt{\frac{16}{2}} = \sqrt{200}$
 $25\frac{j}{2} = 200$ $5\sqrt{8} = \sqrt{200}$
 $25j = 400$ $5\sqrt{4}\sqrt{2} = \sqrt{100}\sqrt{2}$
 $j = 16$ $10\sqrt{2} = 10\sqrt{2} \checkmark$
 $\therefore \boxed{j=16}$

d) $5 + \sqrt{n} = \sqrt{3n}$
 $25 + 10\sqrt{n} + n = 3n$
 $10\sqrt{n} = 2n - 25$
 $100n = 4n^2 - 100n + 625$
 $0 = 4n^2 - 200n + 625$

$$n = \frac{200 \pm \sqrt{200^2 - 4(4)(625)}}{8}$$

$$n = \frac{200 \pm \sqrt{36000}}{8}$$

$$n = \frac{200 \pm 100\sqrt{3}}{8}$$

$$n = \frac{50 \pm 25\sqrt{3}}{2}$$

check $\frac{50 + 25\sqrt{3}}{2}$ $\frac{50 - 25\sqrt{3}}{2}$
 \checkmark \times

$$n = \frac{50 + 25\sqrt{3}}{2}$$

11. $\sqrt{x+8} = -7$
 \uparrow

checking principal square root won't give -7

$$12. \quad 3 + \sqrt{x+17} = x$$

$$\sqrt{x+17} = x-3 \quad \checkmark \text{ Jerry's error}$$

$$x+17 = x^2 - 6x + 9$$

$$0 = x^2 - 7x - 8$$

$$0 = (x-8)(x+1)$$

$$x=8 \quad x=-1$$

$$\text{check } x=8$$

$$3 + \sqrt{25} = 8$$

$$3 + 5 = 8$$

✓

$$x=-1$$

$$3 + \sqrt{16} = -1$$

$$3 + 4 = -1$$

✗ NO

$$\therefore \boxed{x=8}$$

$$13. \quad 50 = 12.6\sqrt{L} + 8$$

$$42 = 12.6\sqrt{L}$$

$$\frac{10}{3} = \sqrt{L}$$

$$\frac{100}{9} = L$$

$$\text{check } 50 = 12.6\left(\frac{10}{3}\right) + 8$$

$$50 = 42 + 8 \quad \checkmark$$

$$L = \frac{100}{9}$$

$$L = 11.1 \text{ m}$$

$$14. \text{ a) } B = 1.33\sqrt{40+10} - 3.49$$

$$B = 6.3$$

$$B = 6 \quad (\text{integer scale})$$

$$\text{b) } 3 = 1.33\sqrt{v+10} - 3.49$$

$$6.49 = 1.33\sqrt{v+10}$$

$$4.88 = \sqrt{v+10}$$

$$23.8 = v+10$$

$$13.8 = v$$

$$13.8 \text{ km/h}$$

$$15. \quad 4 = \frac{1}{5}\sqrt{\frac{m}{3}}$$

$$20 = \sqrt{\frac{m}{3}}$$

$$400 = \frac{m}{3}$$

$$1200 = m$$

$$\boxed{1200 \text{ Kg}}$$

$$16. \quad \sqrt{n} + 2 = n$$

$$\sqrt{n} = n - 2$$

$$n = n^2 - 4n + 4$$

$$0 = n^2 - 5n + 4$$

$$0 = (n-1)(n-4)$$

$$n=1 \quad n=4$$

$$\text{check } n=1$$

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

$$1 + 2 = 1$$

no

$$\text{check } n=4$$

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

$$2 + 2 = 4$$

✓

$$\boxed{n=4}$$

$$17a) v = \sqrt{2hg}$$

$$v = \sqrt{19.6h} \quad (\text{using } 9.8 \text{ m/s}^2 \text{ for gravity})$$

$$b) 30 = \sqrt{19.6h}$$

$$900 = 19.6h$$

$$h = 45.9 \text{ m}$$

$$c) 35 = \sqrt{19.6h}$$

$$1225 = 19.6h$$

$$h = 62.5 \text{ m} \quad \therefore \text{pump will meet requirements}$$

$$18 \quad d = \sqrt{2rh + h^2}$$

$$1609 = \sqrt{400r + 40000}$$

$$2588881 = 400r + 40000$$

$$2548881 = 400r$$

$$r = 6372 \text{ km}$$

$$19. \quad \sqrt{3x} = \sqrt{ax} + 2$$

$$3x = ax + 4\sqrt{ax} + 4$$

$$3x - ax - 4 = 4\sqrt{ax}$$

$$(3-a)x - 4 = 4\sqrt{ax}$$

$$(3-a)^2 x^2 - 8(3-a)x + 16 = 16ax$$

$$(9 - 6a + a^2)x^2 - 24x + 8ax - 16ax = 0$$

$$(a^2 - 6a + 9)x^2 - 8ax = 0$$

$$(a^2 - 6a + 9)x^2 - (8a + 24)x = 0$$

second attempt

$$\sqrt{3x} - 2 = \sqrt{ax}$$

$$3x - 4\sqrt{3x} + 4 = ax$$

$$\boxed{\frac{3x - 4\sqrt{3x} + 4}{x} = a}$$