C11 - 5.0 - Q1abc Radicals Review

a) $\frac{1}{2}\sqrt{45} = 3.35$ ✓

$\frac{1}{2}\ 3\sqrt{5}$

$\frac{3}{2}\sqrt{5} = 3.35$ ✓

45 → 9, 5 → 3, 3

b) $2x\sqrt{125x^5}$

$2x(5\sqrt{5})(x^2\sqrt{x})$

$10x^3\sqrt{5x}$

125 → 25, 5 → 5, 5

c) $\sqrt[3]{189} = 5.73$

$3\sqrt[3]{7} = 5.73$ ✓

189 → 27, 7 → 9, 3 → 3, 3

d) $\sqrt{\frac{1}{16}} = \frac{\sqrt{1}}{\sqrt{16}} = \frac{1}{4}$

$= 0.75$ $= 0.25$ ✓

e) $\sqrt{0.04} = 0.2$

$= \sqrt{\frac{4}{100}} = \frac{\sqrt{4}}{\sqrt{100}} = \frac{2}{10} = \frac{1}{5} = 0.2$ ✓

f) $\frac{\sqrt{12}}{\sqrt{6}} = 1.41$

$= \sqrt{\frac{12}{6}}$

$= \sqrt{2} = 1.41$ ✓

2a) $\sqrt{x^2} = \sqrt{9}$ $(3)^2 = 9$ $(-3)^2 = 9$

$x = \pm 3$

b) $x^2 + 100 = 0$
$-100 \quad -100$
$\sqrt{x^2} = \sqrt{-100}$

NO Solution

c) $\sqrt[3]{x^3} = \sqrt[3]{-64}$

$x = -4$

64
4 16
4 4

$(-4)^3 = -64$

d) $\sqrt{x^2} = \sqrt{3}$

$x = \pm\sqrt{3}$

2e) $(x^{\frac{3}{2}})^{\frac{2}{3}} = (8)^{\frac{2}{3}}$

$x = \sqrt[3]{8^2}$

$x = 2^2$

$x = 4$

$(4)^{\frac{3}{2}} = 8$

3a) $7\sqrt{2} = 9.90$

$\sqrt{7 \cdot 7(2)}$

$\sqrt{98} = 9.90$ ✓

b) $-3\sqrt[3]{6}$

$\sqrt[3]{-3(-3)(-3)(6)}$

$\sqrt[3]{-162}$

c) $\frac{3}{2}x\sqrt[3]{8x}$

$\sqrt[3]{\frac{3}{2}x\left(\frac{3}{2}x\right)\left(\frac{3}{2}x\right)(8x)}$

$\sqrt[3]{27x^4}$

4a) $10\sqrt{5x}(3\sqrt{7})$

$30\sqrt{35x}$

b) $9(3\sqrt{2})$

$27\sqrt{2}$

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

$9(2)$

$= 18$

d) $7\sqrt[3]{3}(2\sqrt[3]{5})$

$14\sqrt[3]{15}$

4e) $9\sqrt[3]{5}(3\sqrt[3]{7})$

$27\sqrt[3]{5}\sqrt[3]{7}$

5) $\sqrt{3}^2$

$= 3$

g) $(\sqrt{x-999})^2$

$x-999$

h) $(2\sqrt{x-1})^2$

$4(x-1)$

$4x-4$

4i) $2\sqrt{7}(3\sqrt{6}+\sqrt{2})$

$6\sqrt{42}+2\sqrt{14}$

j) $(\sqrt{2}+\sqrt{3})(\sqrt{6}+\sqrt{2})$

$\sqrt{12}+2+\sqrt{18}+\sqrt{6}$

$2\sqrt{3}+2+3\sqrt{2}+\sqrt{6}$

k) $(\sqrt{7}+\sqrt{5})(\sqrt{7}-\sqrt{5})$

$7-\sqrt{35}+\sqrt{35}-5$

$7-5=2$

41) $\frac{2\sqrt{8}\sqrt{18}}{4\sqrt{2}}$

$2\sqrt{\frac{18}{2}}$

$2\sqrt{9}$

6

m) $\frac{2\sqrt{8}\sqrt{6x^3}}{4\sqrt{2x}}$

$2\sqrt{\frac{6x^3}{2x}}$

$2\sqrt{3x^2}$

$2x\sqrt{3}$

5a) $\sqrt{12} + 2\sqrt{3} = 6.93$

$2\sqrt{3} + 2\sqrt{3} = 4\sqrt{3} = 6.93$ ✓

b) $2\sqrt{12} - 1\sqrt{75}$

$2(2)\sqrt{3} - 5\sqrt{3}$

$4\sqrt{3} - 5\sqrt{3}$

$= -1\sqrt{3}$

c) $\frac{1}{2}\sqrt{28} + 3\sqrt{63} - 2$

$\frac{1}{2}(2\sqrt{7}) + 3(3\sqrt{7}) - 2$

$\sqrt{7} + 9\sqrt{7} - 2$

$10\sqrt{7} - 2$

5d) $2x\sqrt{20x} + 3\sqrt{45x^3}$

$2x(2\sqrt{5x}) + 3(3x\sqrt{5x})$

$4x\sqrt{5x} + 9x\sqrt{5x}$

$13x\sqrt{5x}$

C11 - 5.0 - Q6abc Radicals Review

6a) $\sqrt{x+2}$

$x+2 \geq 0$

$-2 \quad -2$

$x \geq -2$

b) $\sqrt{2x-3}$

$2x-3 \geq 0$

$\frac{2x}{2} \geq \frac{3}{2}$

$x \geq \frac{3}{2}$

c) $\sqrt{3-x}$

$3-x \geq 0$

$-3 \quad -3$

$\frac{-x}{-1} \geq \frac{-3}{-1}$

$x \leq 3$

7a) $\sqrt{x} - 2 = 6$

$+2 \qquad +2$

$(\sqrt{x})^2 = (8)^2$

$x = 64$

$\sqrt{64} - 2 = 6$

$8 - 2 = 6$ ✓

b) $\sqrt{x} + 8 = 6$

$-8 \qquad -8$

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

$x = 4$

$\sqrt{4} + 8 = 6$

$2 + 8 = 6$

$10 \neq 8$ ✗

$\sqrt{x} = -2$ ←

NO solution

7c) $(\sqrt{x})^2 = (\sqrt{6-x})^2$

$x = 6 - x$

$+x \quad +x$

$\frac{2x}{2} = \frac{6}{2}$

$x = 3$

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

$\sqrt{3} = \sqrt{3}$ ✓

7d) $\frac{2\sqrt{x+4}}{2} = \frac{4}{2}$

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

$x+4 = 4$

$-4 \quad -4$

$x = 0$

$2\sqrt{0+4} = 4$

$2(2) = 4$ ✓

7e) $(x)^2 = (\sqrt{2x+3})^2$

$x^2 = 2x + 3$

$x^2 - 2x - 3 = 0$

$(x-3)(x+1) = 0$

$x = 3 \quad x = -1$

$3 = \sqrt{2(3)+3}$

$3 = \sqrt{9}$ ✓

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

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

$-1 = \sqrt{1}$

$-1 \neq 1$

7f) $(2x)^2 = (\sqrt{7x-3})^2$

$4x^2 = 7x - 3$

$4x^2 - 7x + 3 = 0$

$\frac{-3}{-3} \times \frac{-4}{-4} = 12$

$-3 + -4 = -7$

$(4x^2 - 4x) + (-3x + 3) = 0$

$4x(x-1) - 3(x-1) = 0$

$(x-1)(4x-3) = 0$

$x - 1 = 0$

$x = 1$

$4x - 3 = 0$

$+3 \quad +3$

$\frac{4x}{4} = \frac{3}{4}$

$x = \frac{3}{4}$

$2(1) = \sqrt{7(1)-3}$

$2 = \sqrt{4}$ ✓

$x\left(\frac{3}{4}\right) = \sqrt{7\left(\frac{3}{4}\right)-3}$

$\frac{3}{2} = \sqrt{2.25}$

$\frac{3}{2} = 1.5$ ✓

7g) $\sqrt{x+3} - 1 = x$

$+1 \quad +1$

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

$x+3 = (x+1)(x+1)$

$x+3 = x^2+2x+1$

$0 = x^2+x-2$

$(x+2)(x-1) = 0$

$x+2=0 \qquad x-1=0$

$-2 \quad -2 \qquad +1 \quad +1$

$x=-2 \qquad x=1$

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

$1-1 \neq -2$

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

$\sqrt{4} - 1 = 1$

$2-1=1$ ✓

C11 - 5.0 - Q8abc Radicals Review

8a) $\frac{1}{\sqrt{5}} \cdot \frac{(\sqrt{5})}{(\sqrt{5})} = 0.45$

$\frac{\sqrt{5}}{5} = 0.45$ ✓

b) $\frac{2}{\sqrt{2}} \cdot \frac{(\sqrt{2})}{(\sqrt{2})}$

$\frac{2\sqrt{2}}{2}$

$= \sqrt{2}$

c) $\frac{1}{2\sqrt{3}} \cdot \frac{(\sqrt{3})}{(\sqrt{3})}$

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

$\frac{\sqrt{3}}{6}$

8d) $\frac{5}{3\sqrt{3}} \quad \frac{(3\sqrt{3})(3\sqrt{3})}{(3\sqrt{3})(3\sqrt{3})}$

$\frac{5\ 3\sqrt{9}}{3}$

8c) $\frac{3}{\sqrt{3}+1} \quad \frac{(\sqrt{3}-1)}{(\sqrt{3}-1)}$

$\frac{3\sqrt{3}-3}{3-\sqrt{3}+\sqrt{3}-1}$

$\frac{3\sqrt{3}-3}{3-1}$

$\frac{3\sqrt{3}-3}{2}$

8f) $\frac{(2+\sqrt{3})}{(\sqrt{6}-1)} \cdot \frac{(\sqrt{6}+1)}{(\sqrt{6}+1)}$

$$\frac{2\sqrt{6}+2+\sqrt{18}+\sqrt{3}}{6-\sqrt{6}+\sqrt{6}-1}$$

$$\frac{2\sqrt{6}+2+3\sqrt{2}+\sqrt{3}}{5}$$

8g) $\frac{10}{\sqrt{5}} - \frac{6}{\sqrt{5}-2}$

$2\sqrt{5} - (6\sqrt{5}+12)$

$2\sqrt{5} - 6\sqrt{5} - 12$

$-4\sqrt{5} - 12$

$\frac{10}{\sqrt{5}} \cdot \frac{(\sqrt{5})}{(\sqrt{5})}$

$\frac{2\cancel{10}\sqrt{5}}{\cancel{5}}$

$= 2\sqrt{5}$

$\frac{6}{\sqrt{5}-2} \cdot \frac{(\sqrt{5}+2)}{(\sqrt{5}+2)}$

$\frac{6\sqrt{5}+12}{5+2\sqrt{5}-2\sqrt{5}-4}$

$\frac{6\sqrt{5}+12}{1}$

9) $y = \sqrt{x}$

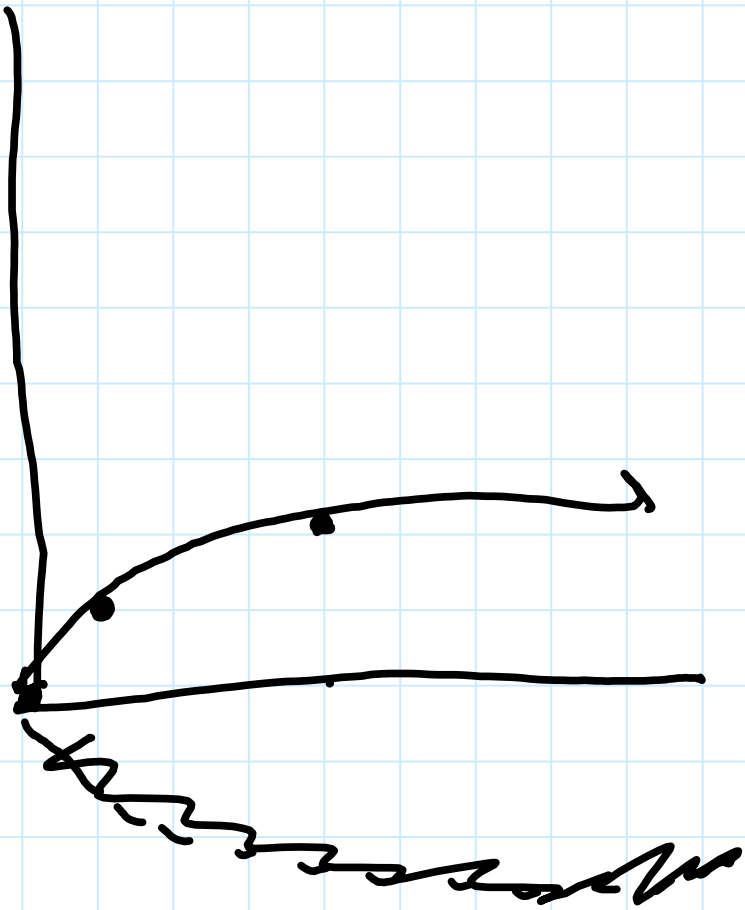
~~$y = \sqrt{-2}$~~

$y = \sqrt{0} = 0$

$y = \sqrt{1} = 1$

$y = \sqrt{4} = 2$

x	y
-2	DNE
-1	DNE
0	0
1	1
~~x~~	
4	2



10) $V_s = \sqrt{2ad}$

$V_s = \sqrt{2(2)(400)}$

$V_s = \sqrt{400}$

$V_s = 20 m/s$

11) $d = \frac{1}{2}at^2$ $\quad V = at$ $\quad 100m = d$ $\quad 2m/s^2 = a$

$100 = \frac{1}{2}(2)(t^2)$

$\sqrt{100} = \sqrt{t^2}$

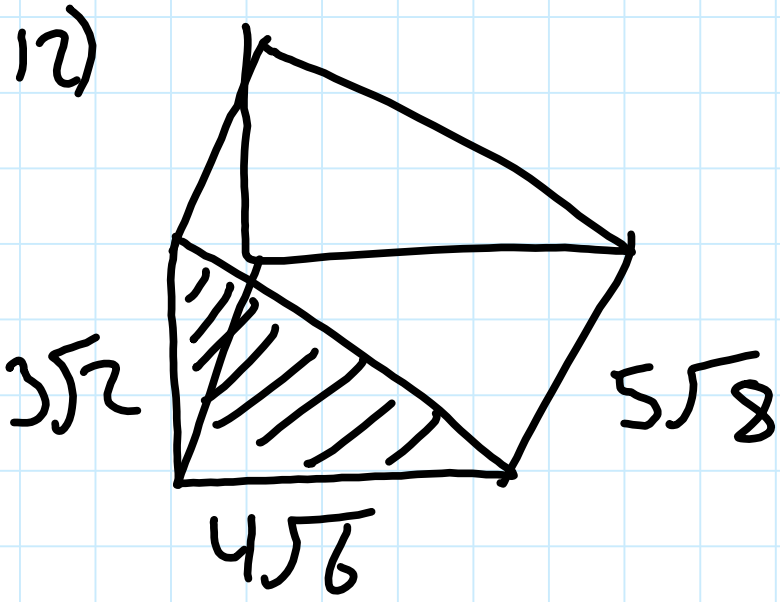
$t = 10s$

$V = at$

$V = (2)(10)$

$V = 20m/s$

12)



$A = \frac{bh}{2}$

$A = \frac{24\sqrt{6}(3\sqrt{2})}{2}$

$A = 6\sqrt{12}$

$A = 6(2)\sqrt{3}$

$A = 12\sqrt{3}$

$V = A_{base}(h)$

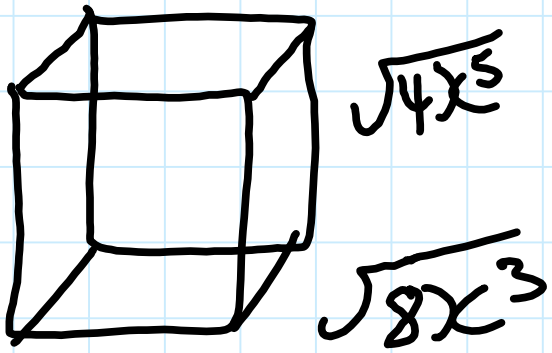
$V = 12\sqrt{3}(5\sqrt{8})$

$V = 60\sqrt{24}$

$V = 60(2\sqrt{6})$

$V = 120\sqrt{6}\,m^3$

13)



$V = LWH$

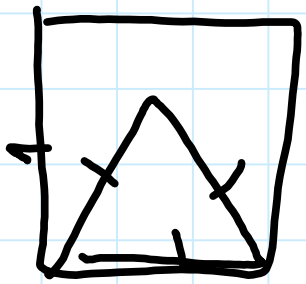
$V = \frac{3}{4}x\left(\sqrt{8x^3}\right)\left(\sqrt{4x^5}\right)$

$V = \frac{3}{4}x\left(\sqrt{32x^8}\right)$

$V = \frac{3}{4}x\left(4\sqrt{2}\right)\left(x^4\right)$

$V = 3x^5\sqrt{2}\ cm^3$

14)



$A = 72m^2$

$s = \sqrt{72}$

$s = 6\sqrt{2}$

$6\sqrt{2} + 6\sqrt{2} + 6\sqrt{2} = 18\sqrt{2}m$

15) $\frac{T}{2\pi} = \frac{2\pi\sqrt{\frac{L}{10}}}{2\pi}$

$\left(\frac{T}{2\pi}\right)^2 = \left(\sqrt{\frac{L}{10}}\right)^2$

$10 \times \left(\frac{T}{2\pi}\right)^2 = \frac{L}{10} \times 10$

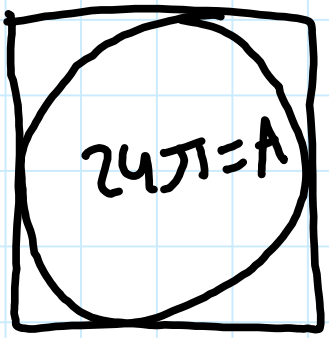
$L = 10\left(\frac{T}{2\pi}\right)^2$

$T = 1.4$

$L = 10\left(\frac{1.4}{2\pi}\right)^2$

$L = 0.49$

16)



$A = \pi r^2$

$\frac{24\pi}{\pi} = \frac{\pi r^2}{\pi}$

$\sqrt{24} = \sqrt{r^2}$

$r = \sqrt{24}$

$r = 2\sqrt{6}$

$2\sqrt{6}(2) = d = 4\sqrt{6}$

$P = 4\sqrt{6} + 4\sqrt{6} + 4\sqrt{6} + 4\sqrt{6}$

$P = 16\sqrt{6}\,cm$

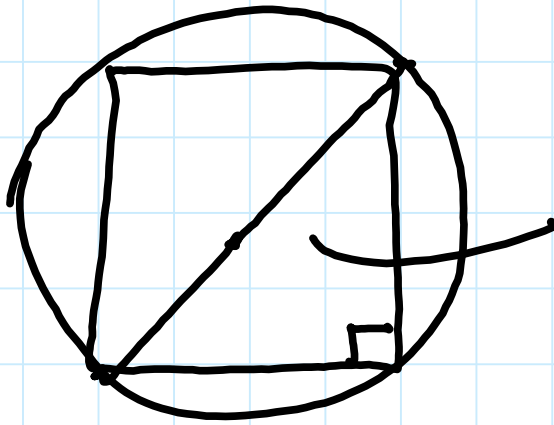
$A = LW$

$A = 4\sqrt{6}(4\sqrt{6})$

$A = 16(6)$

$A = 96\,cm^2$

17)

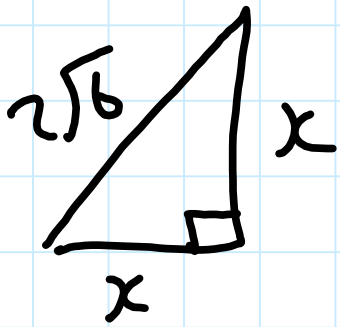


$A = lw$

$A = 2\sqrt{3}(2\sqrt{3})$

$A = 4(3)$

$A = 12m^2$



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

$2x^2 = 4(6)$

$\frac{2x^2}{2} = \frac{24}{2}$

$\sqrt{x^2} = \sqrt{12}$

$x = 2\sqrt{3}m$

$P = 4(2\sqrt{3})$

$P = 8\sqrt{3}m$

$C = 2\pi r$

$C = 2\pi(\sqrt{6})$

$C = 2\pi\sqrt{6}m$

$r = \sqrt{6}$

$A = \pi r^2$

$A = \pi(\sqrt{6})^2$

$A = 6\pi m^2$