23, 9d, 10d, 15

9d) $\frac{2}{3}\sqrt[3]{81} + \frac{\sqrt[3]{375}}{4} - 4\sqrt{99} + 5\sqrt{11}$

$= \frac{2}{3}\sqrt[3]{27\cdot 3} + \frac{1}{4}\sqrt[3]{125\cdot 3} - 4\sqrt{9\cdot 11} + 5\sqrt{11}$

$= \frac{2}{3}(3)\sqrt[3]{3} + \frac{1}{4}(5)\sqrt[3]{3} - 4(3)\sqrt{11} + 5\sqrt{11}$

$= \frac{{}^{4\times}2}{1\times 4}\sqrt[3]{3} + \frac{5}{4}\sqrt[3]{3} - 12\sqrt{11} + 5\sqrt{11}$

$= \frac{13}{4}\sqrt[3]{3} - 7\sqrt{11}$

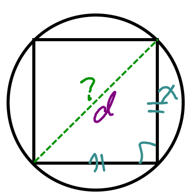
10d) $\frac{w}{5}\sqrt[3]{-64} + \frac{\sqrt[3]{512w^3}}{5} - \frac{2}{5}\sqrt{50w} - 4\sqrt{2w}$

$= \frac{w}{5}(-4) + \frac{8w}{5} - \frac{2}{5}\sqrt{25\cdot 2w} - 4\sqrt{2w}$

$= -\frac{4w}{5} + \frac{8w}{5} - \frac{\cancel{10}^{\,2}}{\cancel{5}}\sqrt{2w} - 4\sqrt{2w}$

$= \frac{4w}{5} - 6\sqrt{2w}$

15.



a) $A_o = \pi r^2$

$38\cancel{\pi} = \cancel{\pi} r^2$

$\pm\sqrt{38} = \sqrt{r^2}$

$\sqrt{38} = r$

$d = 2r$

$\boxed{d = 2\sqrt{38}}$

$A_o = 38\pi\ m^2$

b) $x^2 + x^2 = d^2$ ← pythagoras

$2x^2 = (2\sqrt{38})^2$

$\frac{2x^2}{2} = \frac{4(38)}{2}$

$\sqrt{x^2} = \sqrt{76} \Rightarrow x = \sqrt{76}$

$x = \sqrt{19\cdot 4}$

$\boxed{x = 2\sqrt{19}}$

$\therefore P = 4x$

$= 4(2\sqrt{19})$

$\boxed{P = 8\sqrt{19}}$

#23. $\sqrt{27}, \_\_, \_\_, 9\sqrt{3}$

$\sqrt{27} + 3d = 9\sqrt{3}$

$3d = 9\sqrt{3} - \sqrt{27}$ $\quad \therefore \sqrt{9\cdot 3} = 3\sqrt{3}$

$3d = 9\sqrt{3} - 3\sqrt{3}$

$\frac{3d}{3} = \frac{6\sqrt{3}}{3} \Rightarrow \boxed{d = 2\sqrt{3}}$

5.2a Operations with Radicals

* To multiply and divide radicals we must remember the following properties:

$$\boxed{\sqrt[n]{a}\cdot\sqrt[n]{b}=\sqrt[n]{ab}} \qquad \boxed{\frac{\sqrt[n]{a}}{\sqrt[n]{b}}=\sqrt[n]{\frac{a}{b}}}$$

Note: the indexes MUST always be the SAME

ex. a) $(2\sqrt{3})(5\sqrt{5})$

$= 2\cdot 5\cdot\sqrt{3\cdot 5}$

$= 10\sqrt{15}$

b) $(2\sqrt{7})(4\sqrt{75})$ $= (2\sqrt{7})(4\sqrt{25\cdot 3})$ $\times 5$

$= (2\sqrt{7})(20\sqrt{3})$

$= 40\sqrt{21}$

c) $(7\sqrt{3})(5\sqrt{5} - 6\sqrt{3})$

$= 35\sqrt{15} - 42\sqrt{9}$

$= 35\sqrt{15} - 42(3)$

$= 35\sqrt{15} - 126$

d) $(8\sqrt{2} - 5)(4 - 3\sqrt{2})$

$= 32\sqrt{2} - \cancel{24(2)}^{-48} - 20 + 15\sqrt{2}$

$= 47\sqrt{2} - 68$

e) $9\sqrt[3]{2w}(\sqrt[3]{8w^2} - 3)$

$= 9\sqrt[3]{16w^3} - 27\sqrt[3]{2w}$

$= 9\sqrt[3]{8\cdot 2w^3} - 27\sqrt[3]{2w}$

$= 9(2w)\sqrt[3]{2} - 27\sqrt[3]{2w}$

$= 18w\sqrt[3]{2} - 27\sqrt[3]{2w}$

f) $\frac{4\sqrt[3]{6}}{2\sqrt[3]{3}} = \frac{4}{2}\cdot\sqrt[3]{\frac{6}{3}}$

$= 2\sqrt[3]{2}$

homefun: pg. 289 #1-7