

Alg 2: Homework 30

$$\textcircled{1} \text{ a) } \sqrt[4]{81x^{16}y^8} = \boxed{3x^4y^2}$$

$$\text{b) } 2\sqrt{13} + (\sqrt{256} - \sqrt{52})$$

$$= 2\sqrt{13} + 16 - \sqrt{4 \cdot 13}$$

$$= \cancel{2\sqrt{13}} + 16 - \cancel{2\sqrt{13}} = \boxed{16}$$

$$\textcircled{2} \frac{8\sqrt{24} + 12\sqrt{2}}{4\sqrt{2}}$$

$$= \frac{8\sqrt{24}}{4\sqrt{2}} + \frac{12\sqrt{2}}{4\sqrt{2}}$$

$$= 2\sqrt{12} + 3$$

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

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

$$= \boxed{4\sqrt{3} + 3}$$

$$\textcircled{3} \text{ a) } \frac{6}{\sqrt{27}} \cdot \frac{\sqrt{3}}{\sqrt{3}} = \frac{6\sqrt{3}}{\sqrt{81}} = \frac{6\sqrt{3}}{9} = \boxed{\frac{2\sqrt{3}}{3}}$$

$$\text{b) } \frac{5}{4\sqrt{2}} \cdot \frac{\sqrt{2}}{\sqrt{2}} = \frac{5\sqrt{2}}{4 \cdot 2} = \boxed{\frac{5\sqrt{2}}{8}}$$

$$\textcircled{4} \text{ a) } \frac{9}{5-\sqrt{13}} \left(\frac{5+\sqrt{13}}{5+\sqrt{13}} \right) = \frac{9(5+\sqrt{13})}{(5-\sqrt{13})(5+\sqrt{13})}$$

$$= \frac{9(5+\sqrt{13})}{25-13} = \frac{9(5+\sqrt{13})}{12} = \boxed{\frac{3(5+\sqrt{13})}{4}}$$

OR $\frac{15 + 3\sqrt{13}}{4}$

$$b) \frac{5\sqrt{2} + 1}{2\sqrt{2} - 1} \cdot \left(\frac{2\sqrt{2} + 1}{2\sqrt{2} + 1} \right)$$

$$= \frac{(5\sqrt{2} + 1)(2\sqrt{2} + 1)}{(2\sqrt{2} - 1)(2\sqrt{2} + 1)} = \frac{20 + 5\sqrt{2} + 2\sqrt{2} + 1}{8 - 1}$$

$$= \frac{21 + 7\sqrt{2}}{7} = \frac{7(3 + \sqrt{2})}{7} = \boxed{3 + \sqrt{2}}$$

$$\textcircled{5} \quad \left(\frac{2}{y+5} \right) \cdot \frac{(y+5)(y-5)}{(y+5)(y-5)} + \frac{20}{(y+5)(y-5)} = \left(\frac{2}{1} \right) \cdot \frac{(y+5)(y-5)}{(y+5)(y-5)}$$

$$\frac{2(y-5)}{2y-10} + \frac{20}{2y+10} = \frac{(y+5)(y-5)}{y^2-25}$$

$$0 = y^2 - 24y - 35$$

$$0 = (y-7)(y+5)$$

$$y-7=0 \quad \vee \quad y+5=0$$

$$y=7 \quad \vee \quad y=-5$$

Check ($y=7$)

$$\frac{2}{7+5} + \frac{20}{49-25} \stackrel{?}{=} 1$$

$$\frac{2}{12} + \frac{20}{24} \stackrel{?}{=} 1$$

$$\frac{4}{24} + \frac{20}{24} \stackrel{?}{=} 1$$

$$\frac{24}{24} = 1$$

$$1 = 1$$

Check ($y=-5$)

$$\frac{2}{-5+5} + \frac{20}{25-25} \stackrel{?}{=} 1$$

$$\frac{2}{0} + \frac{20}{0} \stackrel{?}{=} 1$$

undefined

reject $y=-5$

$$\boxed{\{7\}}$$

$$(6) \quad x^2 + x - 2 < 12x - 32$$

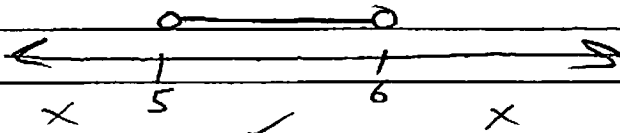
$$x^2 - 11x + 30 < 0$$

$$(x - 6)(x - 5) < 0$$

$$x - 6 = 0 \vee x - 5 = 0$$

$$x = 6$$

$$x = 5$$



$$\boxed{\{5 < x < 6\}}$$