

Alg 2: Homework 27

$$\textcircled{1} \sqrt{136} = \sqrt{4 \sqrt{34}} = \boxed{2\sqrt{34}}$$

$$\textcircled{2} \sqrt{144a^4} = \boxed{12a^2}$$

$$\begin{aligned} \textcircled{3} \sqrt{18x^6y^{10}} &= \sqrt{9} \sqrt{2} \sqrt{x^6} \sqrt{y^{10}} \\ &= 3\sqrt{2} \cdot x^3 y^5 = \boxed{3x^3y^5\sqrt{2}} \end{aligned}$$

$$\begin{aligned} \textcircled{4} -5\sqrt{49x^3z^4} &= -5\sqrt{49} \sqrt{x^3} \sqrt{z^4} \\ &= -5(7)(x)(\sqrt{x})(z^2) \\ &= \boxed{-35xz^2\sqrt{x}} \end{aligned}$$

$$\textcircled{5} \sqrt{\frac{8}{49}} = \frac{\sqrt{8}}{\sqrt{49}} = \frac{\sqrt{4}\sqrt{2}}{7} = \boxed{\frac{2\sqrt{2}}{7}}$$

$$\textcircled{6} \sqrt{\frac{9x^4}{x^6b^2}} = \frac{\sqrt{9x^4}}{\sqrt{x^6b^2}} = \frac{3x^2}{x^3b} = \boxed{\frac{3}{xb}}$$

or, simplify the radicand first:

$$\sqrt{\frac{9x^4}{x^6b^2}} = \sqrt{\frac{9}{x^2b^2}} = \frac{\sqrt{9}}{\sqrt{x^2b^2}} = \frac{3}{xb}$$

7) Which expression is in simplest form?

(1) $\frac{x}{x^2} = \frac{1}{x}$

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

(2) $\frac{9}{x^2+9}$

(4) $\frac{x^2-6x+9}{x^2-x-6} = \frac{(x-3)(x-3)}{(x-3)(x+2)} = \frac{x-3}{x+2}$

cannot factor

(8) $\left(\frac{x(x-2)}{x} \cdot \frac{9}{x-2} \right) = 12$ [LCD = x(x-2)]

$9(x-2) + 9x = 12x(x-2)$

$9x-18 + 9x = 12x^2 - 24x$

$18x - 18 = 12x^2 - 24x$

$0 = 12x^2 - 42x + 18$

$0 = 6(2x^2 - 7x + 3)$

$0 = 6(2x-1)(x-3)$

$2x-1=0 \quad \vee \quad x-3=0$

$x = \frac{1}{2} \quad \vee \quad x = 3$

Check $(x = \frac{1}{2})$

Check $(x = 3)$

$\frac{9}{\frac{1}{2}} + \frac{9(2)}{(\frac{1}{2}-2)^2} \stackrel{?}{=} 12$

$\frac{9}{3} + \frac{9}{3-2} \stackrel{?}{=} 12$

$18 + \frac{18}{1-4} \stackrel{?}{=} 12$

$3 + \frac{9}{1} \stackrel{?}{=} 12$

$18 + \frac{18}{-3} \stackrel{?}{=} 12$

$3 + 9 \stackrel{?}{=} 12$

$18 - 6 \stackrel{?}{=} 12$

$12 = 12$

$12 = 12$

$\left\{ \frac{1}{2}, 3 \right\}$

$$\textcircled{9} \quad 3|x-4| + \frac{16}{-10} \geq \frac{16}{-10}$$

$$\frac{3|x-4|}{3} \geq \frac{6}{3}$$

$$|x-4| \geq 2$$

$$x-4 \geq 2 \quad \vee \quad x-4 \leq -2$$

$$x \geq 6 \quad \vee \quad x \leq 2$$

$$\boxed{\{x \geq 6 \vee x \leq 2\}}$$

