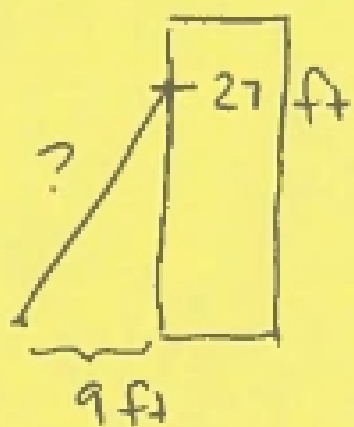


Wksh 3 solns

1.



let  $c$  = length of ladder

$$9^2 + 27^2 = c^2$$

$$81 + 729 = c^2$$

$$810 = c^2$$

$$\sqrt{810} = c$$

$$\sqrt{81 \cdot 10} = c$$

$$c = \boxed{9\sqrt{10} \text{ ft}}$$

$$\sqrt{9} < \sqrt{10} < \sqrt{16}$$

$$3 < \sqrt{10} < 4$$

closer to 3.

$$\text{so } c \approx 9 \cdot (3.2) \text{ ft}$$

$$28.8 \text{ ft}$$

2. a.

$$\frac{y+2}{y^2-6y+8} + \frac{3y-8}{y^2-5y+6}$$

$$= \frac{y+2}{(y-4)(y-2)} + \frac{3y-8}{(y-3)(y-2)}$$

$$= \frac{(y+2)(y-3)}{(y-2)(y-3)(y-4)} + \frac{(3y-8)(y-4)}{(y-2)(y-3)(y-4)}$$

$$= \frac{y^2+2y-3y-6+3y^2-12y-8y+32}{(y-2)(y-3)(y-4)}$$

$$= \frac{4y^2-21y+26}{(y-2)(y-3)(y-4)}$$

$$= \frac{(4y-13)(y-2)}{(y-3)(y-4)(y-2)}$$

$$= \boxed{\frac{4y-13}{(y-3)(y-4)}}$$

2b

$$\frac{\frac{2}{x+4}}{\frac{x+3}{x^2-16}}$$

$$= \frac{2}{x+4} \cdot \frac{x^2-16}{x+3}$$

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

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

$$2c = \frac{1}{h} \cdot \left( \frac{1}{(x+h)^2} - \frac{1}{x^2} \right)$$

$$= \frac{1}{h} \cdot \left( \frac{x^2}{x^2(x+h)^2} - \frac{(x+h)^2}{x^2(x+h)^2} \right)$$

$$= \frac{1}{h} \cdot \frac{x^2 - (x^2 + 2xh + h^2)}{x^2(x+h)^2}$$

$$= \frac{1}{h} \cdot \frac{-2xh - h^2}{x^2(x+h)^2}$$

$$= \frac{h(-2x-h)}{h \cdot x^2(x+h)^2}$$

$$= \boxed{\frac{-2x-h}{x^2(x+h)^2}}$$

$$\begin{aligned}
 3a \quad & \frac{(\sqrt{x}-3)(\sqrt{x}-3)}{x^3} \\
 &= \frac{x-3\sqrt{x}-3\sqrt{x}+9}{x^3} \\
 &= \frac{x}{x^3} - \frac{6\sqrt{x}}{x^3} + \frac{9}{x^3} \\
 &= \boxed{x^{-2} - 6x^{-5/2} + 9x^{-3}}
 \end{aligned}$$

$$\begin{aligned}
 3b \quad & x^{-2/3} + 5x^{7/3} \\
 &= \frac{1}{x^{2/3}} + 5x^{7/3} \\
 &= \frac{1}{x^{2/3}} + \frac{5x^{7/3} \cdot x^{2/3}}{x^{2/3}} \\
 &= \frac{1+5x^3}{x^{2/3}} \\
 &= \frac{1+5x^3}{x^{2/3}} \cdot \frac{x^{1/3}}{x^{1/3}} \\
 &= \boxed{\frac{(1+5x^3)x^{1/3}}{x}}
 \end{aligned}$$

rationalize denom

$$\begin{aligned}
 4a \quad & x^2 + 3x - 10 = 0 \\
 & (x+5)(x-2) = 0 \\
 & \boxed{x = -5 \text{ or } x = 2}
 \end{aligned}$$

$$\begin{aligned}
 4b \quad & x^3 + 2x^2 - x - 2 = 0 \\
 & x^2(x+2) - 1(x+2) = 0 \\
 & (x+2)(x^2-1) = 0 \\
 & (x+2)(x-1)(x+1) = 0 \\
 & \boxed{x = -2, x = 1, \text{ or } x = -1}
 \end{aligned}$$

$$\begin{aligned}
 4c \quad & x^2 = 9 \\
 & x = \pm \sqrt{9} \\
 & \boxed{x = \pm 3}
 \end{aligned}$$

$$\begin{aligned}
 5a. \quad & (x^2 - 2x + 1) + 5 = 0 \\
 & \left(\frac{-2}{2}\right)^2 = (-1)^2 = 1 \\
 & (x^2 - 2x + 1) + 5 - 1 = 0 \\
 & (x-1)^2 + 4 = 0 \\
 & (x-1)^2 = -4 \\
 & \boxed{\text{No real solutions}}
 \end{aligned}$$

$$\begin{aligned}
 5b. \quad & 2x^2 + x - 4 = 0 \\
 & 2\left(x^2 + \frac{1}{2}x - 4\right) = 0 \\
 & \left(\frac{1/2}{2}\right)^2 = \left(\frac{1}{4}\right)^2 = \frac{1}{16} \\
 & 2\left(x^2 + \frac{1}{2}x + \frac{1}{16}\right) - 4 - \frac{2}{16} = 0
 \end{aligned}$$

$$\begin{aligned}
 & 2\left(x + \frac{1}{4}\right)^2 = 4 + \frac{1}{8} \\
 \frac{1}{2} \cdot 2\left(x + \frac{1}{4}\right)^2 &= \frac{33}{8} \cdot \frac{1}{2} \\
 \sqrt{\left(x + \frac{1}{4}\right)^2} &= \pm \sqrt{\frac{33}{16}}
 \end{aligned}$$

$$\begin{aligned}
 x + \frac{1}{4} &= \frac{\pm \sqrt{33}}{4} - \frac{1}{4} \\
 & - \frac{1}{4}
 \end{aligned}$$

$$x = \boxed{\frac{\pm \sqrt{33} - 1}{4}}$$

$$\begin{aligned}
 6a \quad & (x+1)^{2/3} - (x+1)^{1/3} - 2 = 0 \\
 & u = (x+1)^{1/3}
 \end{aligned}$$

$$u^2 - u - 2 = 0$$

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

$$u = 2 \quad u = -1$$

$$\sqrt[3]{x+1} = 2 \quad \text{or} \quad \sqrt[3]{x+1} = -1$$

$$x+1 = 2^3 \quad \text{or} \quad x+1 = (-1)^3$$

$$x = 7 \quad \text{or} \quad x = -2$$

$$\boxed{x = 7 \text{ or } x = -2}$$