M-PC Pre-Calculus 10/18

$$\left(\sqrt{56-x}\right) = (x)^2$$

$$\sqrt{56-x} = x$$

$$56 - x = x^2$$
$$-56 \quad +x \qquad +x \quad -56$$

$$x^2 + x - 56 = 0$$

$$\underline{8} * \underline{-7} = -56$$
$$\underline{8} + \underline{-7} = +1$$

$$(x+8)(x-7) = 0$$

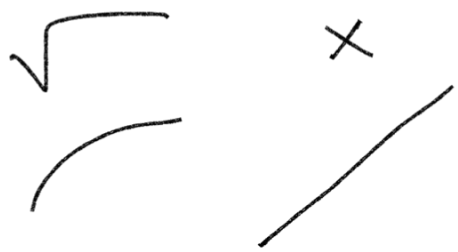
$$x + 8 = 0 \qquad x - 7 = 0$$
$$-8 \quad -8 \qquad +7 \quad +7$$

$$\boxed{x = -8} \quad \boxed{x = 7}$$

$$\sqrt{56-x} = x$$

$$\sqrt{56-7} = 7$$
$$\sqrt{49} = 7 \checkmark$$

$$\sqrt{56-(-8)} = -8$$
$$\sqrt{56+8} = -8$$
$$\cancel{\sqrt{64} = -8} \checkmark$$



1.) $$\left|\boxed{3 + 10v}\right| = 73$$

$$3 + 10v = 73$$
$$-3 \qquad -3$$

$$\frac{10v}{10} = \frac{70}{10}$$

$$\boxed{v = 7}$$

$$3 + 10v = -73$$
$$-3 \qquad -3$$

$$\frac{10v}{10} = \frac{-76}{10}$$

$$v = \frac{-76}{10} = \boxed{\frac{-38}{5}}$$

2.) $|9x-9| + 7 = 70$
$\quad\quad\quad -7 \quad -7$

$|\boxed{9x-9}| = 63$

$9x-9=63$
$+9 \quad +9$

$\frac{9x}{9} = \frac{72}{9}$

$\boxed{x=8}$

$9x-9=-63$
$+9 \quad +9$

$\frac{9x}{9} = \frac{-54}{9}$

$\boxed{x=-6}$

3) $6|6-10m| + 8 = 6m + 80$
$\quad\quad -8 \quad\quad\quad -8$

$\frac{6|6-10m|}{6} = \frac{6m}{6} + \frac{72}{6}$

$|\boxed{6-10m}| = m+12$

$6-10m = m+12$
$-m \quad -m$

$6-11m = 12$
$-6 \quad\quad -6$

$\frac{-11m}{-11} = \frac{6}{-11}$

$m = \boxed{-\frac{6}{11}}$

$6-10m = -m-12$
$+m \quad\quad +m$

$6-9m = -12$
$-6 \quad\quad -6$

$\frac{-9m}{-9} = \frac{-18}{-9}$

$\boxed{m=2}$

$x^6 - 9x^3 + 8 = 0$

$x^2 - 9x + 8 = 0$

$(x^3)^2 - 9x^3 + 8$

$u^2 - 9u + 8 = 0$

u-substitution

$x^3 = u$

$\underline{-1} * \underline{-8} = 8$

$\underline{-1} + \underline{-8} = -9$

$(u-1)(u-8) = 0$

$u-1=0$
$+1 \quad +1$
$u=1$

$u-8=0$
$+8 \quad +8$
$u=8$

$\sqrt[3]{x^3} = \sqrt[3]{1}$

$\boxed{x=1}$

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

$\boxed{x=2}$

$x^8 - 17x^4 + 16 = 0$ $\qquad$ $x^4 = u$

$(x^4)^2 - 17x^4 + 16 = 0$

$\underline{-16} * \underline{-1} = 16$

$\underline{-16} + \underline{-1} = -17$

$u^2 - 17u + 16 = 0$

$u - 16 = 0$
$+16 \quad +16$

$u - 1 = 0$
$+1 \quad +1$

$(u-16)(u-1) = 0$

$u = 16$ $\qquad$ $u = 1$

$\sqrt[4]{x^4} = \sqrt[4]{16}$ $\qquad$ $\sqrt[4]{x^4} = \sqrt[4]{1}$

$x = \pm 2$ $\qquad$ $x = \pm 1$

$2(\boxed{1-y})^2 + 5(\boxed{1-y}) - 12 = 0$ $\qquad$ $u = 1-y$

$2u^2 + 5u - 12 = 0$

$\underline{2}$: $\boxed{1}\boxed{2}$

$\underline{12}$: $12 \cdot 1$, $6 \cdot 2$, $\boxed{4}\boxed{3}$

$(2u-3)(u+4) = 0$ $\qquad$ $u = 1-y$

$2u - 3 = 0$
$+3 \quad +3$

$\frac{2u}{2} = \frac{3}{2}$

$\boxed{u = \frac{3}{2}}$

$u + 4 = 0$
$-4 \quad -4$

$\boxed{u = -4}$

$\frac{3}{2} = 1 - y$
$-1 \quad -1$

$\frac{1}{2} = -y$
$\frac{}{-1} \quad \frac{}{-1}$

$\boxed{y = -\frac{1}{2}}$

$-4 = 1 - y$
$-1 \quad -1$

$\frac{-5}{-1} = \frac{-y}{-1}$

$\boxed{y = 5}$

$$2x^{\frac{1}{2}} + x^{1/4} - 1 = 0 \qquad u = x^{1/4}$$

$$2x^{2/4} + x^{1/4} - 1 = 0$$

$$\frac{2}{2\cdot 1} \qquad \frac{1}{1\,1}$$

$$\{\ 2\left(x^{\frac{1}{4}}\right)^2 + x^{1/4} - 1 = 0$$

$$2u^2 + u - 1 = 0$$

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

$$u + 1 = 0$$
$$-1 \quad -1$$
$$\boxed{u = -1}$$

$$2u - 1 = 0$$
$$+1 \quad +1$$
$$\frac{2u}{2} = \frac{1}{2}$$
$$\boxed{u = \frac{1}{2}}$$

$$\left(x^{1/4}\right)^4 = (-1)^4 \qquad \left(x^{1/4}\right)^4 = \left(\frac{1}{2}\right)^4$$

$$\boxed{x = 1} \qquad \boxed{x = \frac{1}{16}}$$

$$\frac{1}{2}\cdot\frac{1}{2}\cdot\frac{1}{2}\cdot\frac{1}{2} = \frac{1}{16}$$

$$\frac{x^{9/4}}{x^{1/4}} - \frac{2x^{5/4}}{x^{1/4}} - \frac{3x^{1/4}}{x^{1/4}} = 0$$

$$x^{1/4}\left(x^{8/4} - 2x^{4/4} - 3\right) = 0$$

$$x^{1/4}\left(x^2 - 2x - 3\right) = 0$$

$$x^{1/4}(x-3)(x+1) = 0$$

$$\left(x^{1/4}\right)^4 = (0)^4 \qquad \boxed{x = 0}$$

$$x - 3 = 0$$
$$+3 \quad +3$$
$$\boxed{x = 3}$$

$$x + 1 = 0$$
$$-1 \quad -1$$
$$\cancel{\boxed{x = -1}}$$

$$\left| 2p^{3} - 3p^{2} \right| - 8p + 12 = 0$$

$$2p^3 - 3p^2 \qquad \underbrace{-8p + 12}$$

$$p^2(2p-3) \qquad -4(2p-3)$$

$$(2p-3)(p^2-4) = 0$$

$$2p - 3 = 0 \qquad p^2 - 4 = 0$$

$$+3 \quad +3 \qquad +4 \quad +4$$

$$\frac{2p}{2} = \frac{3}{2} \qquad \sqrt{p^2} = \sqrt{4}$$

$$\boxed{p = \frac{3}{2}} \qquad \boxed{p = \pm 2}$$