① Solve by factoring: $\left(\sqrt{7-4x}\right)^2 = (2-2x)^2$

$7-4x = (2-2x)(2-2x)$

$7-4x = 4-4x-4x+4x^2$

$+4x \quad +4x$

$-7 \quad -7$

$0 = 4x^2-4x-3$

x	(-6, 2)
-12	
-4	-4

$0 = 4x^2-6x+2x-3$

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

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

$2x-3=0 \qquad 2x+1=0$

$x=\frac{3}{2} \qquad x=-\frac{1}{2}$

~~$x=\frac{3}{2}$~~

$\sqrt{7-4\left(\frac{3}{2}\right)} = 2-2\left(\frac{3}{2}\right)$

$\sqrt{7-6} = 2-3$

$\sqrt{1} = -1$

$1 \neq -1$

$x=-\frac{1}{2}$

$\sqrt{7-4\left(-\frac{1}{2}\right)} = 2-2\left(-\frac{1}{2}\right)$

$\sqrt{7+2} = 2+1$

$\sqrt{9} = 3$

$3 = 3$ ✓

② Solve by Completing the Square $\cdot\left(\frac{-2}{x-2}+\frac{3x}{x+2}\right)^{\cdot(x^2-4)=(x+2)(x-2)} = \frac{-8}{x^2-4}\cdot(x^2-4)$

$(x+2)(x-2)\cdot\frac{-2}{x-2} + (x+2)(x-2)\cdot\frac{3x}{x+2} = -8$

$-2(x+2) + 3x(x-2) = -8$

$-2x-4+3x^2-6x = -8$

$3x^2-8x+4=0$

$3\left[\left(x^2-\frac{8}{3}x+4\right)-4\right]+4=0$

$\left(\frac{1}{2}\left(-\frac{8}{3}\right)\right)^2 = \left(-\frac{4}{3}\right)^2 = \frac{16}{9}$

$3\left[\left(x^2-\frac{8}{3}+\frac{16}{9}\right)-\frac{16}{9}\right]+4=0$

$3\left(x-\frac{4}{3}\right)^2-\frac{16}{9}\cdot 3+4=0$

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

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

$\left(x-\frac{4}{3}\right)^2=\frac{4}{9}$

$x-\frac{4}{3}=\pm\sqrt{\frac{4}{9}}$

$x=\frac{4}{3}\pm\frac{2}{3}=\frac{6}{3}$ ⊛ $\frac{2}{3}$

$=2$ ⊛ $\frac{2}{3}$

Check $x\neq 2$

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

DIV by 0

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

$\frac{-2}{\frac{2}{3}-2}+\frac{3\left(\frac{2}{3}\right)}{\frac{2}{3}+2}=\frac{-8}{\left(\frac{2}{3}\right)^2-4} \Rightarrow -\frac{72}{32}=-\frac{72}{32}$ ✓

③ Solve using the quadratic formula: $\frac{1}{2}x^4 - 6x^2 + 10 = 0$

Let $x^2 = z$

$$\frac{1}{2}z^2 - 6z + 10 = 0$$

$$z = \frac{-(-6) \pm \sqrt{(-6)^2 - 4\left(\frac{1}{2}\right)(10)}}{2\left(\frac{1}{2}\right)} = \frac{6 \pm \sqrt{36 - 20}}{1}$$

$$= 6 \pm \sqrt{16} = 6 \pm 4 = 10, 2 = z$$

$x^2 = 10$ $\qquad$ $x^2 = 2$

$x = \pm\sqrt{10}$ $\qquad$ $x = \pm\sqrt{2}$ $\qquad$ 4 answers

(4) Jerry and Millie are washing cars. Working alone, Jerry takes 5 minutes more than Millie to wash a car. Working together, it takes them 10 minutes.

a) How long does it take Millie to wash a car?

b) How long does it take Jerry to wash a car?

	time	Rate
Jerry	$x+5$ min	$\frac{1}{x+5}$
Millie	x	$\frac{1}{x}$
together	10 min	$\frac{1}{10}$

Add the rates

$\Rightarrow \frac{1}{x+5} + \frac{1}{x} = \frac{1}{10}$

$$x(x+5)\left(\frac{1}{x+5} + \frac{1}{x}\right) = \left(\frac{1}{10}\right)x(x+5)$$

$$x(x+5)\cdot\frac{1}{x+5} + x(x+5)\cdot\frac{1}{x} = 0.1\cdot(x^2+5x)$$

$$x + x+5 = 0.1x^2 + 0.5x$$

$$0 = 0.1x^2 - 1.5x - 5$$

$$x = \frac{-(-1.5) \pm \sqrt{(-1.5)^2 - 4(0.1)(-5)}}{2(0.1)}$$

$$= \frac{1.5 \pm \sqrt{2.25+2}}{0.2} = 17.81, -2.81$$

neg time

a) 17.81 min b) 22.81 min