① Dave and Linda both climb stairs at the gym. Dave climbs 0.8 stairs/second and Linda climbs 280 floors per hour. Assume 1 floor = 10 stairs. Who is faster?

To compare how fast Dave and Linda climb stairs we need to use the same units for both. Let's use floor/hr

$$\frac{0.8 \text{ stairs}}{\text{sec}} = \frac{\frac{1}{10} \cdot 0.8}{\frac{1}{3600} \text{ hr}} \text{ floor} =$$

$$= 288 \text{ floor hour}.$$

Dave is faster.

② Solve $3x(x-5)=17$

$3x^2-15x-17=0$ is a quadratic, the solutions are $x=\dfrac{15\pm\sqrt{15^2-4\cdot 3(-17)}}{6}=$

$\dfrac{15\pm\sqrt{429}}{6}$.

③ Solve $\sqrt{x^2-x-3}=\sqrt{x^2-4}$

square both sides

$x^2-x-3=x^2-4$ so $x=1$ but

we cannot accept this solution

because $1^2-1-3<0$ and $1^2-4<0$ so

There are no solutions

4, Solve $x^2+x-2<0$

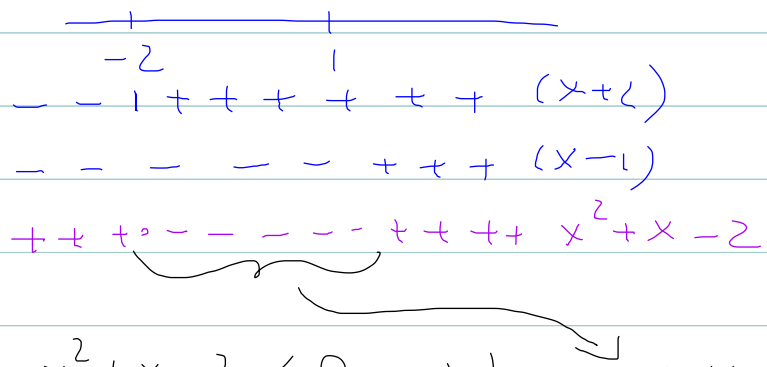
a) First solve $x^2+x-2=0$; $x=\dfrac{-1\pm\sqrt{1-4(-2)}}{2}$

$x=-2, 1$

So $x^2+x-2=(x+2)(x-1)$

$x^2 + x - 2 < 0$

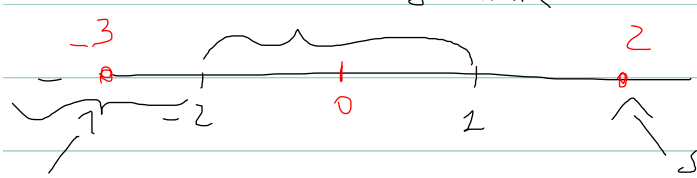
you can either look at $(x+2)$ and $(x-1)$ separately



$x^2 + x - 2 < 0$ when $-2 < x < 1$

or you can "check values" (you need calculus to justify this method)

same sign here $0^2 - 0 - 2 < 0$



same sign here

same sign here

$(-3)^2 + 3 - 2 > 0$

$2^2 + 2 - 2 > 0$

(5) Simplify $\dfrac{7-\frac{1}{3}}{2+\frac{1}{6}} + \frac{1}{2}$

$$\frac{\frac{21-1}{3}}{\frac{12+1}{6}} = \frac{20}{3} \cdot \frac{6}{13} = \frac{40}{13} + \frac{1}{2} = \frac{80+13}{26}$$

$$= \frac{93}{26}$$ (This is an exact answer)
sometimes WebAssign wants exact answers

(6) Solve
$$2x - y = 13$$
$$3x + 4y = 3$$

$$\begin{cases} y = 2x - 13 \\ 3x + 4(2x-13) = 3 \end{cases} \qquad \begin{cases} y = 2x - 13 \\ 3x + 8x - 52 = 3 \end{cases}$$

$$\begin{cases} y = 2x - 13 \\ 11x = 55 \end{cases} \qquad \begin{cases} x = 5 \\ y = -3 \end{cases}$$

7) Solve $y = \frac{1}{2}x + 1$

$x^2 + y^2 = 25$

$$x^2 + \left(\frac{1}{2}x + 1\right)^2 = 25$$

$$\frac{5}{4}x^2 + x - 24 = 0$$

$$x = \frac{-1 \pm \sqrt{1 - 4\,\frac{5}{4}\cdot 24}}{2\cdot\frac{5}{4}} = 4,\ -4.8$$