1.3 : 3, 4, 11
2.1 : 12, 16, 18, 20
2.2 : 5, 7, (15) 21
2.3 : 5, 12, 18

2.2.15 $y' = \underbrace{\frac{2x}{1+2y}}_{y \neq -\frac{1}{2}}$, $y(2) = 0$

(a) $\int (1+2y)\,dy = \int 2x\,dx$ (1/2)

$y^2 + y = x^2 + C$ (1/2)

$y(2) = 0$: $0^2 + 0 = 2^2 + C$

$C = -4$

$y^2 + y = x^2 - 4$ (1/2)

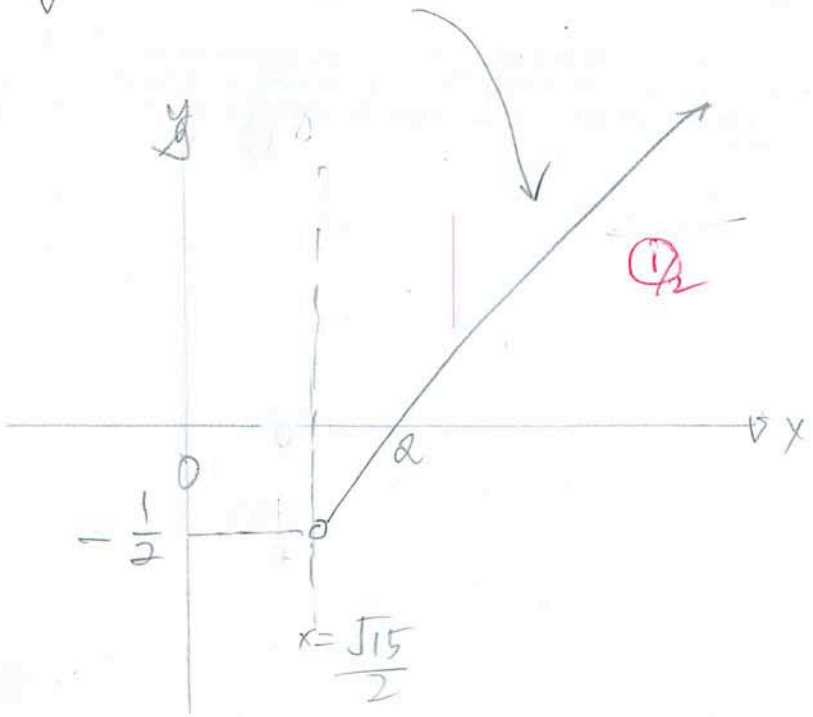
$y^2 + y + 4 - x^2 = 0$

$y = \frac{-1 \pm \sqrt{1^2 - 4(4 - x^2)}}{2(1)}$ (1/2)

$= -\frac{1}{2} \pm \frac{\sqrt{4x^2 - 15}}{2}$

With $y(2) = 0$:

$y = -\frac{1}{2} + \frac{\sqrt{4x^2 - 15}}{2}$ (1/2)



(1/2)

(c)

$4x^2 - 15 \geq 0$ (1/2)

$x^2 \geq \frac{15}{4}$

$|x| \geq \frac{\sqrt{15}}{2}$ (1/2)

But $|x| \neq \frac{\sqrt{15}}{2}$, otherwise

$4x^2 - 15 = 0$

and $y = -\frac{1}{2}$ (1/2)

So $|x| > \frac{\sqrt{15}}{2}$, i.e.,

$x < -\frac{\sqrt{15}}{2}$ or $x > \frac{\sqrt{15}}{2}$ (1/2)

must include initial value of x, i.e., $x = 2$