$\boxed{15.2}$

(#4)  a) $\frac{dy}{dt} = -2y$

$$y(t) = C e^{-2t}$$    we know $y(0) = \sqrt{2}$
                        from $(0, \sqrt{2})$

$$\sqrt{2} = C e^{-2(0)} \implies C = \sqrt{2}$$

$$\boxed{y(t) = \sqrt{2}\, e^{-2t}}$$

b)   $\frac{dy}{dt} = -2t$

what function $y$ will give derivative $\frac{dy}{dt} = -2t$ ?

$$y = -t^2 + C$$

if $y(0) = \sqrt{2}$,       $\sqrt{2} = 0 + C \implies C = \sqrt{2}$

$$\boxed{y = -t^2 + \sqrt{2}}$$

c)  $\frac{dy}{dt} = -2$

$$y = -2t + C$$

$$y(0) = \sqrt{2}$$

$$\sqrt{2} = 0 + C \implies C = \sqrt{2}$$

$$\boxed{y = -2t + \sqrt{2}}$$