(d) $r^2+2r+5=0$ $\quad y=Ae^{-t}=y''$ $\quad (1-2+5)Ae^{-t} \stackrel{?}{=} 8e^{-t}$

$(r+1)^2+4=0$ $\quad y'=-Ae^{-t}$ $\quad A=2$

$\lambda=-1\pm 2i$

$$\boxed{y=2e^{-t}+c_1e^{-t}\sin 2t+c_2e^{-t}\cos 2t}$$

10

(e) $r^2-r-6=0$ $\quad y=Ae^{3t}$ $\quad (9-3-6)A=e^{3t}$

$(r-3)(r+2)=0$ $\quad y'=3Ae^{3t}$ $\quad$ No solution.

10 $\quad \lambda=-2,3$ $\quad y''=9Ae^{3t}$

$y=Ate^{3t}$

$y'=Ae^{3t}+3Ate^{3t}$

$y''=3Ae^{3t}+3Ae^{3t}+9Ate^{3t}$

So then $y''-y'-6y=Ae^{3t}(6-1)+Ate^{3t}(9-3-6) \stackrel{?}{=} e^{3t}$

so $A=1/5$

$$\boxed{y=\frac{1}{5}te^{3t}+c_1e^{-2t}+c_2e^{3t}}$$

(f) $\lambda=\pm 2i$ $\quad y''-4y=-4at^2-4bt-4c+2a \stackrel{?}{=} 8t^2$

10 $\quad y=at^2+bt+c$ $\quad a=-2,\ b=0,\ c=\frac{1}{2}a=-1$

WRONG EQ'N $\quad y'=2at+b$

$y''=2a$

$$\boxed{y=-2t^2-1+c_1\sin 2t+c_2\cos 2t}$$

(f) $r=\pm 2$ $\quad y_p$ ok from above

$$\boxed{y=-2t^2-1+c_1e^{2t}+c_2e^{-2t}}$$