#17] $W(e^{2t}, g) = 3e^{4t}$
$= e^{2t} g'(t) - 2e^{2t} g(t)$ $\Big\}$ $g' - 2g = 3e^{2t} \to g(t) = 3te^{2t} + ce^{2t}$.

#22] $y'' + 4y' + 3y = 0$, $t_0 = 1$.
General solution $y = c_1 e^{-3t} + c_2 e^{-t}$. $W(e^{-3t}, e^{-t}) = 2e^{-4t}$, hence are linearly independent. Now we look for a combination c_1, c_2 to produce
$y_1(1) = 1$, $y_1'(1) = 0$ $\to$ $c_1 = -e^3/2$, $c_2 = 3e/2$
$y_2(1) = 0$, $y_2'(1) = 1$ $\to$ $c_1 = -e^3/2$, $c_2 = e/2$.
So the fundamental set is $-\frac{1}{2}e^{-3(t-1)} + \frac{3}{2}e^{-(t-1)}$, $-\frac{1}{2}e^{-3(t-1)} + \frac{1}{2}e^{-(t-1)}$

#24] $y'' - 2y' + y = 0$, $y_1(t) = e^t$, $y_2(t) = te^t$
Check that both y_1 and y_2 satisfy the ODE.
Then, $W(y_1, y_2) = e^{2t} \neq 0$. Hence, form a fundamental set.

[3.3] #3] $f(t) = e^{\lambda t}\cos\mu t$, $g(t) = e^{\lambda t}\sin\mu t$, $\mu \neq 0$
Suppose that $e^{\lambda t}\cos\mu t = Ae^{\lambda t}\sin\mu t$ for some $A \neq 0$, on an interval I.
Since $\sin\mu t \neq 0$ on some subinterval $I_0 \subset I$, $\tan\mu t = A$ on I_0.
But $\tan x$ is not constant on any interval. This contradiction means that our assumption $e^{\lambda t}\cos\mu t = Ae^{\lambda t}\sin\mu t$ is false.

#9] $W(t) = t\sin^2 t$ has only isolated zeros (only points), so $W(t)$ cannot vanish identically on any open interval. Hence, functions are independent.

#11] $c_1 y_1 + c_2 y_2$ are also solutions. $W(c_1 y_1, c_2 y_2) = (c_1 y_1)(c_2 y_2)' - (c_1 y_1)'(c_2 y_2) = c_1 c_2 W(y_1, y_2)$.
Since $W(y_1, y_2)$ is not identically zero, neither is $W(c_1 y_1, c_2 y_2)$.

#16] $(\cos t)y'' + (\sin t)y' - ty = 0$. $p(t) = \sin t/\cos t \to W(t) = c\exp\left(-\int \frac{\sin t}{\cos t}\,dt\right)$
$= c\exp(\ln|\cos t|) = c\cos t$.

#25] y_1 and y_2 are differentiable. So, $y_1'(t_0) = y_2'(t_0) = 0$ at some t_0 in the interval of definition. This implies $W(y_1, y_2)(t_0) = 0$. But $W(y_1, y_2)(t) =$
$= c\exp\left(-\int p(t)\,dt\right)$ which cannot be equal to zero unless $c = 0$.
Hence, $W(y_1, y_2) \equiv 0$, which cannot happen for a fundamental set.