AREA ACCUMULATION!

1. $g(0) = \int_0^0 f(t)\,dt = 0$
$g(1) = \int_0^1 f(t)\,dt = 1$ ($\frac{1}{4}\pi(2)^2$)
$g(2) = \int_0^2 f(t)\,dt = 3$
$g(4) = \int_0^4 f(t)\,dt = 3+\pi$
$g(6) = \int_0^6 f(t)\,dt = 3$

2. $g'(\frac{1}{2}) = f(\frac{1}{2}) = 1$
$g'(1) = f(1) = 2$
$g'(4) = f(4) = 0$
$g'(6) = f(6) = -2$

3. $g''(\frac{1}{2}) = f'(\frac{1}{2}) = 2$
$g''(1) = f'(1) = \text{DNE}$
$g''(1.5) = f'(1.5) = 0$

4. $(0,4)$ $g' = f \rightarrow$ f is POSITIVE ON $(0,4)$.

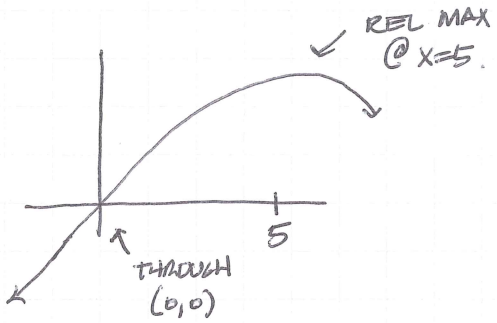
5. $(0,1)$ $g'' = f' \rightarrow$ f is INCREASING ON $(0,1)$

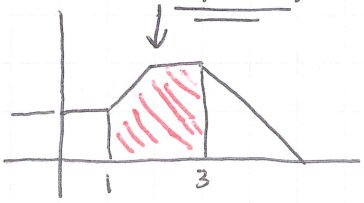
6. SADLY, THERE IS NO POINT OF INFLECTION SINCE $g'' = f'$ AND F HAS NO POINT WHERE IT SWITCHES FROM INCREASING TO DECREASING OR DECREASING TO INCREASING

7. RACE 0, 4, 6 → WHERE $g' = f$ IS ZERO
↑ ENDPOINTS

$g(0) = 0$
$g(4) = 3+\pi \rightarrow$ ABSOLUTE MAX IS $3+\pi$ AT $x = 4$.
$g(6) = 3$

8. $\int_0^0 f(t)\,dt = 0$
$\int_0^2 f(t)\,dt = 2\frac{1}{2}$
$\int_0^{-1} f(t)\,dt = -1$
↑ UPSIDE DOWN!

9. 

10. $F(3) - F(1) = 3\frac{1}{2}$.


11. $F(4)$ $F' = f$; f is POSITIVE ON $(3,4)$

12. $F(5)$ $F' = f$; f is NEGATIVE ON $(5,6)$

13. $F'(4) = 1$
$F''(4) = -1$

14. RELATIVE MAX; $F' = f$
f SWITCHES FROM POSITIVE TO NEGATIVE AT $x = 5$.

15. $(3,6)$ $F'' = f'$
f is DECREASING ON $(3,6)$

16. $(5,\infty)$ $F' = f$
f is NEGATIVE ON $(5,\infty)$