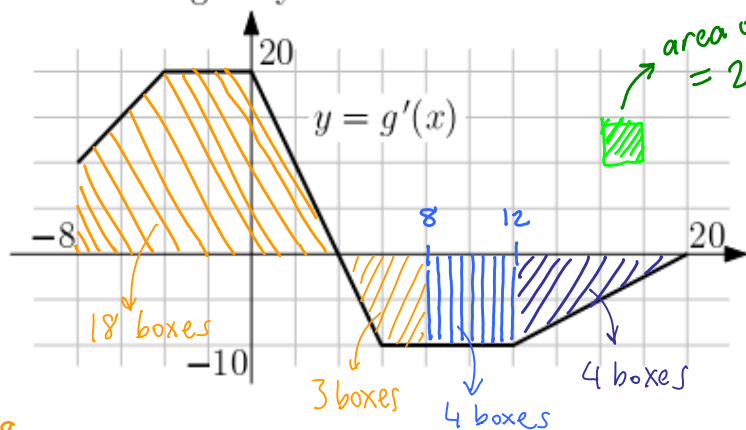


Show your work in all problems.

FTC tells integral of r.o.c. is total change

1. The graph of $g'(x)$ is given below. Using the graph fill in the table. Write down which definite integrals you have used. (similar to #12 p246)



x	-8	8	12	20
$g(x)$	-73	77	37	-3

$\Delta g = 150$ $\Delta g = -40$ $\Delta g = -40$

$$\int_{-8}^8 g'(x) dx = g(8) - g(-8)$$

$$180 - 30 = 77 - g(-8)$$

$$g(-8) = 77 - 180 + 30 = -73$$

$$\int_8^{12} g'(x) dx = g(12) - g(8)$$

$$-40 = 37 - g(8)$$

$$g(8) = 77$$

$$\int_{12}^{20} g'(x) dx = g(20) - g(12)$$

$$-40 = g(20) - 37$$

$$-3 = g(20)$$

2. For a function $r(t)$ we know that $\int_1^7 r(t) dt = 11$, $\int_1^3 r(t) dt = 4$. Compute $\int_3^7 r(t) dt$



$$\int_1^3 r(t) dt + \int_3^7 r(t) dt = \int_1^7 r(t) dt$$

$$4 + ? = 11$$

Property 1 in page 253

answer: $11 - 4 = 7$

3. Given $F(x) = \int_1^x \cos(2w) dw$, find the derivative function $F'(x)$ use 2nd FTC, page 253

$$F'(x) = \cos(2x) \quad \text{by 2nd FTC}$$

4. Find the equation of the tangent line to the curve $y = r(x) = x^3 + 3x^2$ at $x = -1$.

Point of tangency: $(-1, f(-1)) = (-1, 2)$

$$r'(x) = 3x^2 + 6x$$

slope of tangent line = $m = r'(-1) = 3 - 6 = -3$

Tangent line: $y - 2 = -3(x - (-1))$

Similar to Example 5, page 139