

1 | Let $F(x) = \int_0^x f(t)dt$

1.1 | complete the table

| | | | | | |
|--------|---|---------------|---------------|---------------|---|
| x | 0 | 1 | 2 | 3 | 4 |
| $F(x)$ | 0 | $\frac{4}{3}$ | $\frac{8}{3}$ | $\frac{4}{3}$ | 0 |

1.2 | sketch the function



2 | $G(x) = \int_2^x f(t)dt$

2.1 | complete the table

| | | | | | |
|------|----------------|----------------|---|----------------|----------------|
| x | 0 | 1 | 2 | 3 | 4 |
| G(x) | $-\frac{8}{3}$ | $-\frac{4}{3}$ | 0 | $-\frac{4}{3}$ | $-\frac{8}{3}$ |

2.2 | sketch the function



3 | 3

3.1 | complete the table

| | | | | | |
|------|---|---------------|---------------|---------------|---|
| x | 0 | 1 | 2 | 3 | 4 |
| H(x) | 0 | $\frac{4}{3}$ | $\frac{8}{3}$ | $\frac{4}{3}$ | 0 |

3.2 | sketch the function

same as 1b

4 | complete the table

| | $F(x)$ | $G(x)$ | $H(x)$ |
|-----------|------------|--------|--------|
| maximum | $4x+2$ | | |
| minimum | $4x$ | | |
| increases | $4x, 4x+2$ | | |
| decreases | $4x-2, 4x$ | | |

The other columns are the same, because $H(x) = F(x)$ and $G(x) = H(x) - \frac{8}{3}$.

5 | why does it work over the entire domain?

The argument for each cell is the same: it should work across the domain because the function is periodic.

6 | family of functions

Changing the 'zero point' of the derivative just shifts the graph up and down, by up to the range of the function.