

Naam student: \_\_\_\_\_

Leerjaar: \_\_\_\_\_

Klas:  Bo  Bb

Nummer toets volgens OER: \_\_\_\_\_

Datum: \_\_\_\_\_

Cijfer: \_\_\_\_\_

## Oefentoets Integreeren

1a.  $\sum_{x=1}^5 x^3 = 1^3 + 2^3 + 3^3 + 4^3 + 5^3 = 1 + 8 + 27 + 64 + 125 = 225$

b.  $\sum_{i=1}^4 (2i^2 - 1) = 1 + 7 + 17 + 31 = 56$

2a.  $f(x) = 5x + 1$   
 $F(x) = \frac{5}{2}x^2 + x + C = 2\frac{1}{2}x^2 + x + C$

b.  $g(x) = 2\cos(x)$   
 $G(x) = 2\sin(x) + C$

c.  $h(x) = e^x + 10$   
 $H(x) = e^x + 10x + C$

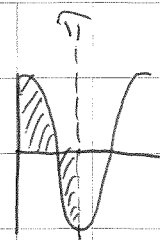
d.  $i(x) = \frac{4}{x^2} = 4x^{-2}$   
 $I(x) = \frac{4}{-1}x^{-1} + C = -4x^{-1} + C = -\frac{4}{x} + C$

e.  $j(x) = \sin(2x)$   
 $J(x) = -\frac{1}{2}\cos(2x) + C$

3.  $\int_0^5 -x^2 dx = \left[-\frac{1}{3}x^3\right]_0^5 = -\frac{125}{3} = -41\frac{2}{3}$

4.  $\int_0^1 x^2 - 4 dx = \left[\frac{1}{3}x^3 - 4x\right]_0^1 = \frac{1}{3} - 4 = -3\frac{2}{3}$

5.  $\int_0^{\pi} \cos(x) dx = \left[\sin(x)\right]_0^{\pi} = \sin(\pi) - \sin(0) = 0$   
 $2 \cdot \int_0^{\frac{1}{2}\pi} \cos(x) dx = 2 \cdot \left[\sin(x)\right]_0^{\frac{1}{2}\pi} = 2 \cdot (1 - 0) = 2$



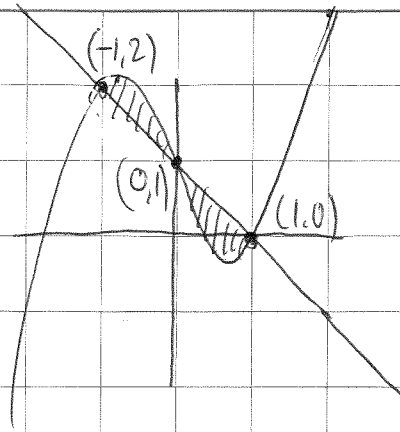
$$6. a) x^3 - 2x + 1 = -x + 1$$

$$x^3 - x = 0$$

$$x(x^2 - 1) = 0$$

$$x(x+1)(x-1) = 0$$

$$x=0 \text{ of } x=-1 \text{ of } x=1$$



$$b) \int_{-1}^0 x^3 - 2x + 1 + x - 1 dx = \left[ \frac{1}{4}x^4 - \frac{1}{2}x^2 \right]_{-1}^0 = 0 - \left( \frac{1}{4} - \frac{1}{2} \right) = \frac{1}{4}$$

$$\int_0^1 -x + 1 - x^3 + 2x - 1 dx = \left[ -\frac{1}{4}x^4 + \frac{1}{2}x^2 \right]_0^1 = \left( -\frac{1}{4} + \frac{1}{2} \right) - 0 = \frac{1}{4}$$

$$7. \sin(2x) = \cos(x)$$

$$2\sin(x)\cos(x) = \cos(x)$$

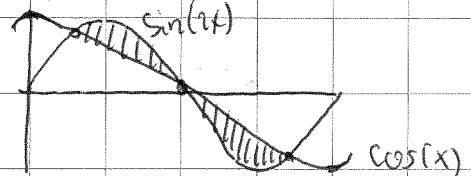
$$2\sin(x) = 1$$

$$\sin(x) = \frac{1}{2}$$

$$x = \sin^{-1}\left(\frac{1}{2}\right) = \frac{1}{6}\pi \text{ of } \pi - \frac{1}{6}\pi = \frac{5}{6}\pi$$

$$\text{of } \cos(x) = 0$$

$$x = \cos^{-1}(0) = \frac{1}{2}\pi$$



$$\int_{\frac{1}{6}\pi}^{\frac{1}{2}\pi} \sin(2x) - \cos(x) dx = \left[ -\frac{1}{2}\cos(2x) - \sin(x) \right]_{\frac{1}{6}\pi}^{\frac{1}{2}\pi} = \left( \frac{1}{2} - 0 \right) - \left( \frac{1}{2}\sqrt{3} - \frac{1}{2} \right) = 1 - \frac{1}{2}\sqrt{3}$$

$$\int_{\frac{1}{2}\pi}^{\frac{5}{6}\pi} \cos(x) - \sin(2x) dx = \left[ \sin(x) + \frac{1}{2}\cos(2x) \right]_{\frac{1}{2}\pi}^{\frac{5}{6}\pi} = \left( \frac{1}{2} + \frac{1}{4} \right) - \left( 1 - \frac{1}{2} \right) = \frac{1}{4}$$

0.38

↑  
moeilijke opgave.