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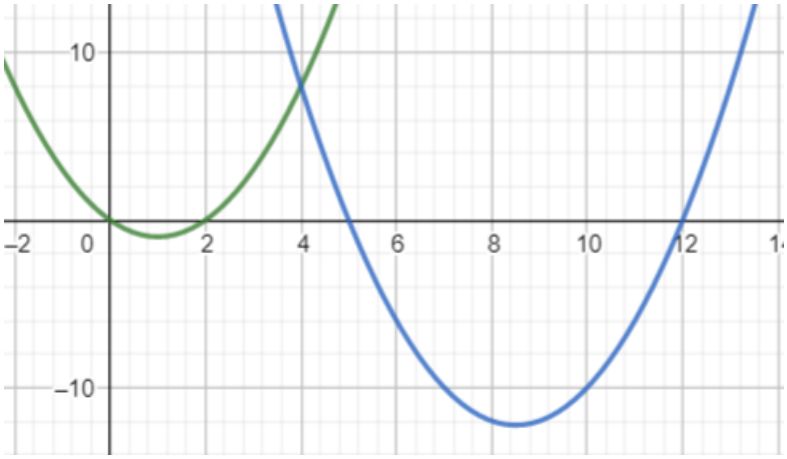
Opgave 376

$$f(x) = x^2 - 2x$$
$$g(x) = x^2 - 17x + 60$$



Find skærings punkter

$$x_{1,2} = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$$

Skæring med x-aksen

$f(x)$

$$a_f = 1$$
$$b_f = -2$$
$$c_f = 0$$

$$a = \frac{-(-2) + \sqrt{(-2)^2 - 4 \cdot 1 \cdot 0}}{2 \cdot 1}$$
$$a = 2$$

$g(x)$

$$a_g = 1$$
$$b_g = -17$$
$$c_g = 60$$

$$c = \frac{-(-17) - \sqrt{(-17)^2 - 4 \cdot 1 \cdot 60}}{2 \cdot 1}$$
$$c = 5$$

Skæring mellem g og f

$$f(x) = g(x)$$
$$x^2 - 2x = x^2 - 17x + 60$$
$$x^2 - x^2 - 2x + 17x = 60$$
$$15x = 60$$
$$x = \frac{60}{15}$$
$$b = x = 4$$

Find areal

$$F(x) = \int f(x)\, dx$$
$$Define: F(x) = \frac{1}{3}x^3 - x^2$$

$$G(x) = \int g(x)\, dx$$
$$Define: G(x) = \frac{1}{3}x^3 - \frac{17}{2}x^2 + 60x$$

$$A_f = [F(x)]_a^b$$
$$A_f = F(4) - F(2)$$
$$A_f = 6{,}666667$$

$$A_g = [G(x)]_b^c$$
$$A_g = G(5) - G(4)$$
$$A_g = 3{,}833333$$

$$A = A_f + A_g$$
$$A = 6.666 + 3.833$$
$$A = 10.5$$