

Eksamensoppgave 1T, Høst 2019

DEL 1:

Oppg. 1 (2p.)

$$\frac{0,00046 \cdot 25 \text{ 000 000}}{0,05} = \frac{46 \cdot 25^5}{5} \cdot 10^{-4+6+2} = 230 \cdot 10^4 = \underline{\underline{2,3 \cdot 10^6}}$$

Oppg. 2 (2p.)

$$\left. \begin{array}{l} 2x + 3y = 6 \\ 5x + 6y = 18 \end{array} \right\}$$

$$\begin{array}{r} 4x + 6y = 12 \\ -5x - 6y = -18 \\ \hline -x = -6 \end{array}$$

$$\begin{array}{l} \underline{x = 6} \\ \underline{y = -2} \end{array}$$

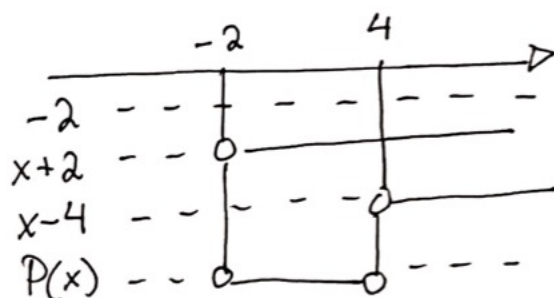
$$\begin{array}{r} 2 \cdot 6 + 3y = 6 \\ 3y = 6 - 12 \\ y = -2 \end{array}$$

Oppg. 3 (2p.)

$$-2(x+2)(x-4) > 0$$

$$P(x) > 0$$

$$\text{når } \underline{\underline{x \in \langle -2, 4 \rangle}}$$



Oppg. 4 (2p.)

$$\frac{2x^2 + x + 3}{x^2 - 9} - \frac{x(x-3)}{(x+3)(x-3)} = \frac{2x^2 + x + 3 - x^2 + 3x}{(x+3)(x-3)} =$$

$$= \frac{x^2 + 4x + 3}{(x+3)(x-3)} = \frac{(x+3)(x+1)}{(x+1)(x-3)} = \underline{\underline{\frac{x+1}{x-3}}}$$

Oppg. 5 (5p.)

$$a) \lg(4x) = 0 \Leftrightarrow 4x = 1 \Leftrightarrow \underline{\underline{x = \frac{1}{4}}}$$

$$b) \lg \frac{\sqrt{501}}{x} = \frac{1}{2} \Leftrightarrow \frac{\sqrt{501}}{x} = \sqrt{10} \Rightarrow \underline{\underline{x = \sqrt{5}}}$$

$$c) 2^{x^2} \cdot 2^{3x} = 16 = 2^4 \Rightarrow x^2 + 3x - 4 = 0$$

$$(x+4)(x-1) = 0$$

$$\underline{\underline{x = -4}} \quad \vee \quad \underline{\underline{x = 1}}$$

Oppg. 6 (2p.)

$$A = (-7, -1)$$

$$B = (5, 2)$$

$$a = \frac{\Delta y}{\Delta x} = \frac{2 - (-1)}{5 - (-7)} = \frac{3}{12} = \frac{1}{4}$$

$$y = \frac{1}{4}x + b$$

setter inn A: $-1 = \frac{1}{4}(-7) + b$

$$-1 = -\frac{7}{4} + b$$

$$b = \frac{7}{4} - \frac{4}{4} = \frac{3}{4} \Rightarrow \underline{\underline{y = \frac{1}{4}x + \frac{3}{4}}}$$

Oppg. 7 (2p.)

$$ax^2 + 3x + 1 = x - 2$$

$$ax^2 + 2x + 3 = 0$$

$$x = \frac{-2 \pm \sqrt{4 - 12a}}{2a}$$

En løsning dersom $4 - 12a = 0 \Rightarrow a = \frac{4}{12} = \underline{\underline{\frac{1}{3}}}$

Oppg. 8 (4p.)

$$f(x) = x^3 + 4x^2 + x - 6$$

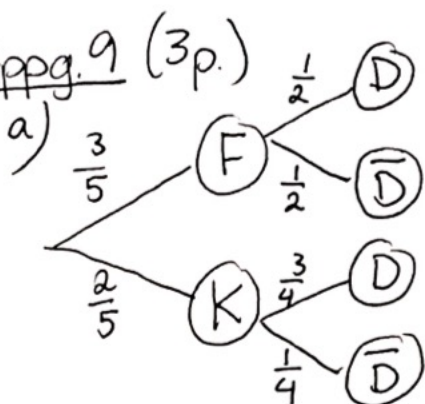
$$a) f'(x) = 3x^2 + 8x + 1$$

$$b) f'(-3) = 3(-3)^2 + 8(-3) + 1 \\ = 27 - 24 + 1 = \underline{\underline{4}}$$

$$c) f(2) = 2^3 + 4 \cdot 2^2 + 2 - 6 = 8 + 16 + 2 - 6 = 20$$

$$f(-1) = (-1)^3 + 4(-1)^2 + (-1) - 6 = -1 + 4 - 1 - 6 = -4$$

$$a = \frac{\Delta y}{\Delta x} = \frac{20 - (-4)}{2 - (-1)} = \frac{24}{3} = \underline{\underline{8}}$$

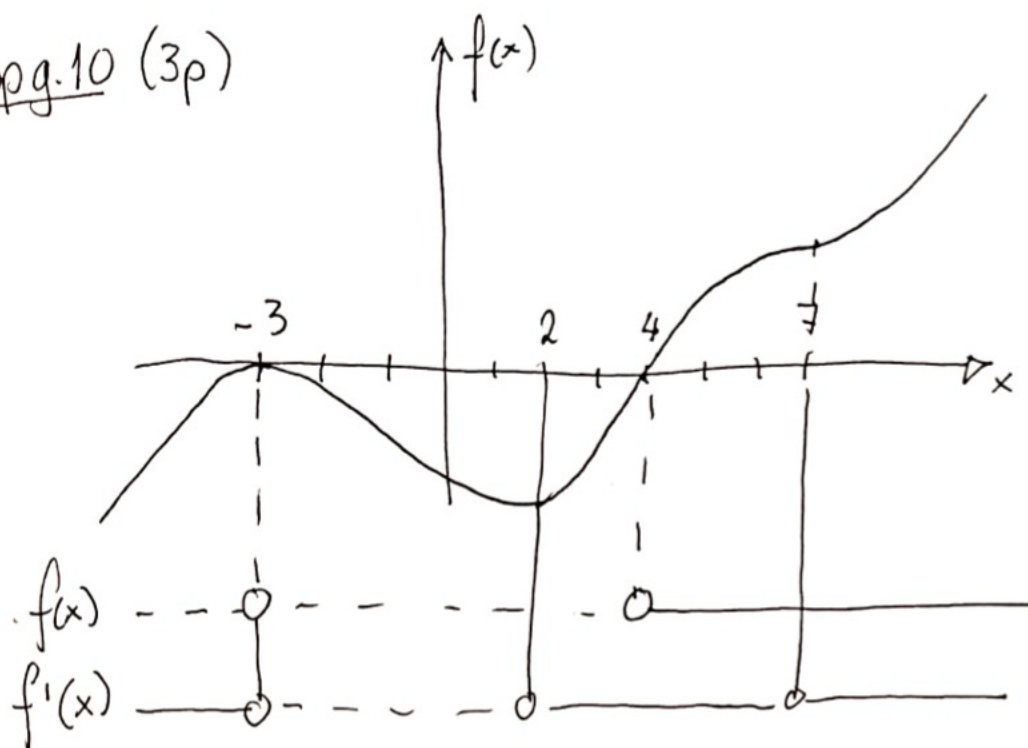
Oppg. 9 (3p.)

$$b) P(D) = P(D|F) + P(D|K)$$

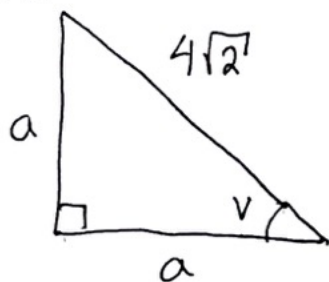
$$= \frac{3}{5} \cdot \frac{1}{2} + \frac{2}{5} \cdot \frac{3}{4}$$

$$= \frac{3}{10} + \frac{6}{20} = \frac{6+6}{20} = \frac{12}{20} = \frac{6}{10}$$

$$= \underline{\underline{0,6}}$$

Oppg. 10 (3p.)

Oppg. 11 (4p)



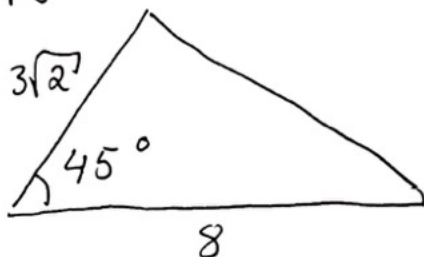
$$\begin{aligned} a) \quad a^2 + a^2 &= (4\sqrt{2})^2 \\ 2a^2 &= 16 \cdot 2 \\ \underline{\underline{a}} &= \underline{\underline{4}} \end{aligned}$$

$$b) \quad \tan v = \frac{\sin v}{\cos v} = \underline{\underline{1}}$$

$$c) \quad \sin v = \cos v = \frac{4}{4\sqrt{2}} = \frac{\sqrt{2}}{2}$$

AM

Oppg. 12 (2p.)

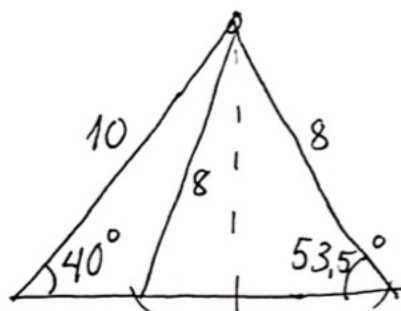
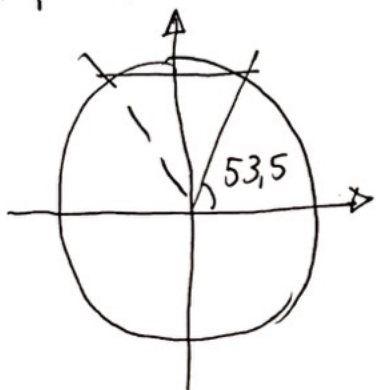


$$\begin{aligned} A &= \frac{1}{2} \cdot 8 \cdot 3\sqrt{2} \cdot \sin 45^\circ \\ &= 4 \cdot 3\sqrt{2} \cdot \frac{2}{\sqrt{2}} = \underline{\underline{24}} \end{aligned}$$

Oppg. 13 (3p.)

$$\frac{\sin x}{10} = \frac{\sin 40^\circ}{8}$$

$$x_1 = 53,5^\circ \quad \vee \quad x_2 = ?$$



$$\begin{aligned} x_2 &= 180^\circ - 53,5^\circ \\ &= \underline{\underline{126,5^\circ}} \end{aligned}$$