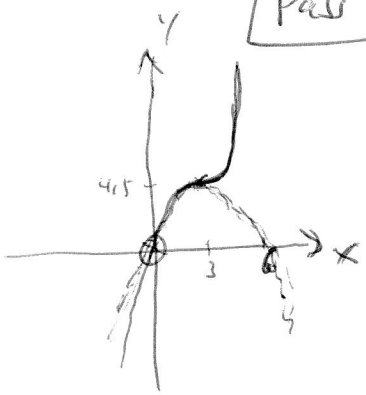
Pass F19

1. a) $f(x) = 0$ $\quad f'(x) = 0$ $\quad f'' = 0$

$x = 0$ $\quad x = 3$ doppelt, Te. P. $\quad x = 3$

$y = \frac{9}{2}$ $\quad$ WP $\quad y = \frac{9}{2}$




b) $WP(3|\frac{9}{2})$ $\}$ Symm. $(6|0)$
$(0|0)$

$$p(x) = -\frac{1}{2} \cdot x(x-6)$$

c) $d(x) = f(x) - p(x) = \frac{1}{6}x(x^2 - 6x + 9)$

$d'(x) = \frac{1}{2}x^2 - 2x + \frac{3}{2} = 0$

$x_1 = 1$ $\quad d(1) = \frac{2}{3}$

$x_2 = 3$

2. a) $A: \begin{pmatrix} x \\ 0 \end{pmatrix} = r$ $\quad t = -4$ $\quad x = 60$ $\quad A(60|0)$

$B: \begin{pmatrix} 0 \\ y \end{pmatrix} = r$ $\quad t = -16$ $\quad y = -12$ $\quad B(0|-12)$

b) $\vec{AB} = \begin{pmatrix} 60 \\ -12 \end{pmatrix}$ $\quad \vec{n}_{AB} = \begin{pmatrix} 12 \\ -60 \end{pmatrix}$

$\vec{r}_C = \vec{r}_B + \vec{n}_{AB} = \begin{pmatrix} 12 \\ -72 \end{pmatrix}$ $\quad C(12|-72)$

$\vec{r}_D = \vec{r}_A + \vec{n}_{AB} = \begin{pmatrix} 72 \\ -60 \end{pmatrix}$ $\quad D(72|-60)$

c) $\vec{r}_M = \frac{1}{2}(\vec{r}_B + \vec{r}_D) = \begin{pmatrix} 36 \\ -36 \end{pmatrix}$ $\quad h: y = -x$

d) $AB: y = \frac{1}{5}x - 12$ $\quad AB \cap h \Rightarrow E(10|-10)$

$CD: y = \frac{1}{5}x - \frac{377}{5}$ $\quad CD \cap h \rightarrow F(62|-62)$

$A_{ABCD} = \frac{1}{2} 60 \cdot 12 + (60^2 + 12^2) = 360 + 3744 = 4104$

$A_{OEFDA} = \frac{1}{2} 60 \cdot 10 + \frac{1}{2} A_{ABCD} = 300 + \frac{1}{2}(60^2 + 12^2) = 2172$ $\quad \frac{1}{161}$

$A_{OBCF} = 1932$ $\quad \frac{181}{161}$

3.

| | | O | F | B |
|---|---|---|---|---|
| M | 70 | 28 | 20 | 22 |
| F | 280 | 14 | 230 | 36 |
| | 350 | 42 | 250 | 58 |

a) 230

b) $P = \frac{250}{350} \cdot \frac{249}{349} = 0,5096 = 50,96\%$

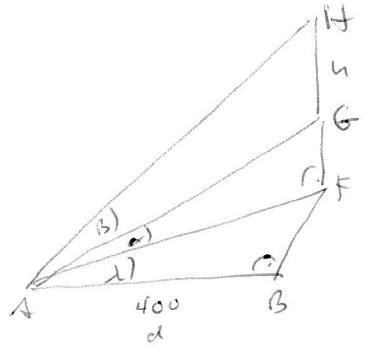
c) i) $P(M \cap O) = \left(\frac{28}{350}\right)^3 + \left(\frac{230}{350}\right)^3 = 28,4\%$

ii) $P(\text{drei Brüche}) = \frac{42}{350} \cdot \frac{250}{350} \cdot \frac{58}{350} = 1,4\%$

d) $P(3\text{F ein Bruch}) = \frac{14}{42} \cdot \frac{230}{250} \cdot \frac{36}{58} = 19,03\%$

PossFig9

4,1.




$\alpha = 15°$
$\beta = 7°$
$\gamma = 21°$

$AF = \frac{d}{\cos\gamma} = 441{,}4$

$(AG = \frac{AF}{\cos\alpha} = 456{,}92)$

$FH = AF \cdot \tan(\alpha+\beta) = 178{,}34$

$GF = AF \cdot \tan\alpha = 118{,}27$

$h = 60\,m$

4,2. $y = a \cdot e^{-bx}$ ; $x > 0$

$y' = -ab\,e^{-bx}$

$y(\ln 2) = 2$ : $a e^{-b\cdot\ln 2} = 2$

$y'(\ln 2) = 4$ : $-ab\,e^{-b\cdot\ln 2} = 4$

$-2b = 4$

$b = -2$

$a = 2e^{+b\cdot\ln 2} = 2e^{-2\cdot\ln 2} = 2(e^{\ln 2})^{-2} = 2\cdot 2^{-2} = \frac{1}{2}$