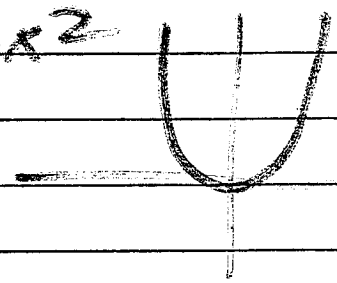
10/22

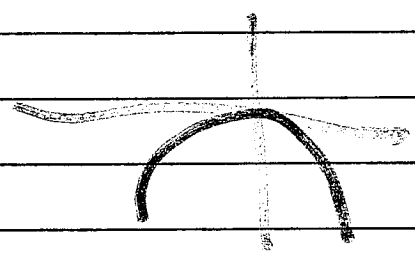
$f(x) = x^2$ $\quad f''(x) = 2 > 0$

$y = x^2$



Cave opening up

$f(x) = -x^2$ $\quad f''(x) = -2 < 0$



Cave opening down

$f(x) = 12x^5 + 15x^4 - 240x^3 + 5.$

Rational zeros $\quad \left(\frac{p}{q}\right)$ is a zero of f

$f\left(\frac{p}{q}\right) = 0$

$\left(x - \frac{p}{q}\right)$

$m\frac{4}{7}$

$p(x) = 5x - 7 = 0 \qquad x = \frac{7}{5}$

$\pm \frac{1, 5}{1, 2, 3, 4, 6, 12}$

10/22

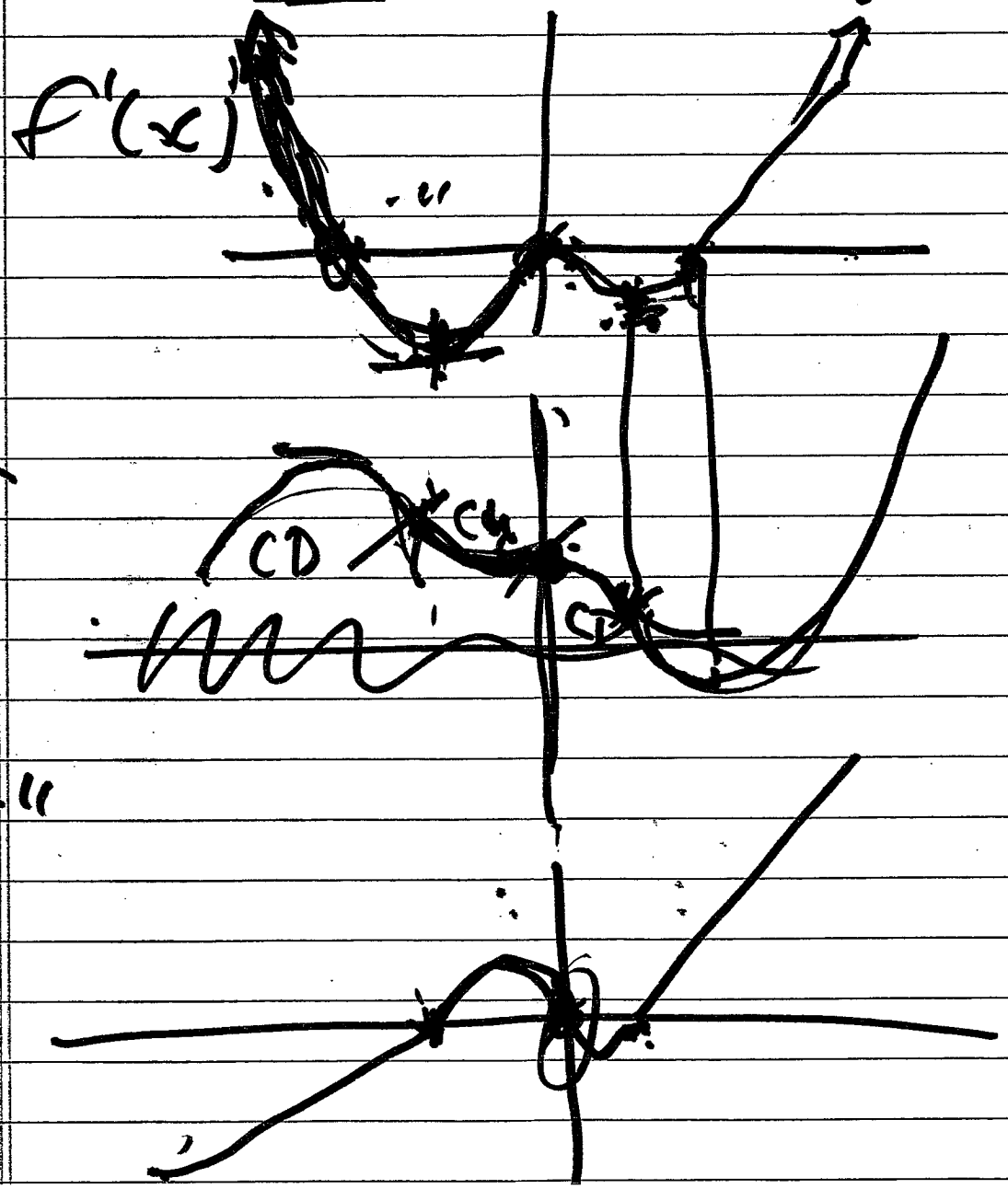
$f(x) = 12x^5 + 15x^4 - 240x^3 + 5$

$f'(x) = 60x^4 + 60x^3 - 720x^2$

$= 60[x^4 + x^3 - 12x^2]$

$= 60(x^2)(x^2 + x - 12)$

$= 60(x-0)^2(x-3)(x+4)$



$$f'(x) = 60(x^4 + x^3 - 12x^2)$$

$$f''(x) = 60(4x^3 + 3x^2 - 24x)$$

$$= 60x(4x^2 + 3x - 24)$$

$f''(x) = 0$ at $x = 0$, and

$4(x - (\ \ )^1(x - (\ \ ))^1$

(3) $2, 1, 0, -1, -2$

$\pm x^2$

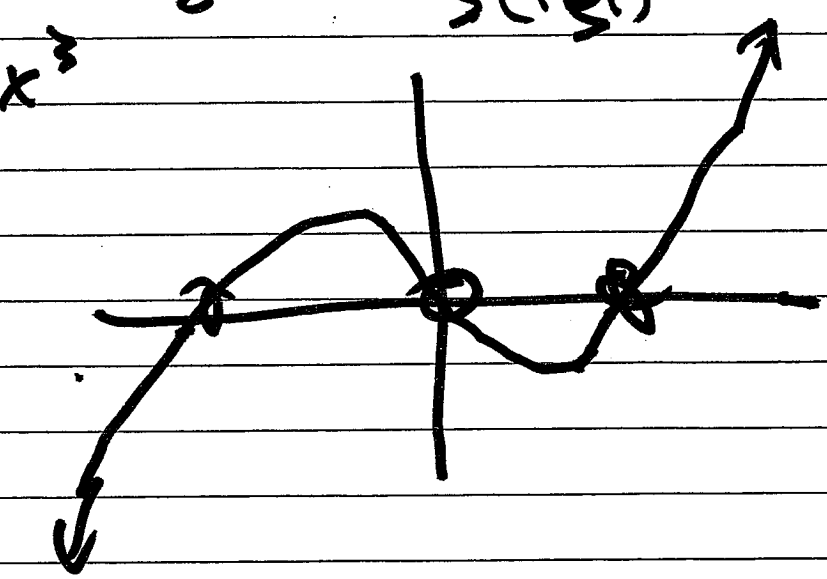
$$4x^2 + 3x - 24 = 0$$

$9 + 3.93$

$$x = \frac{-3 \pm \sqrt{3^2 - 4 \cdot 4(-24)}}{8}$$

$3(131)$

$$f''(x) = 240x^3$$



$a = 0.06$

$y = 1 - ax^2 \quad a > 0$

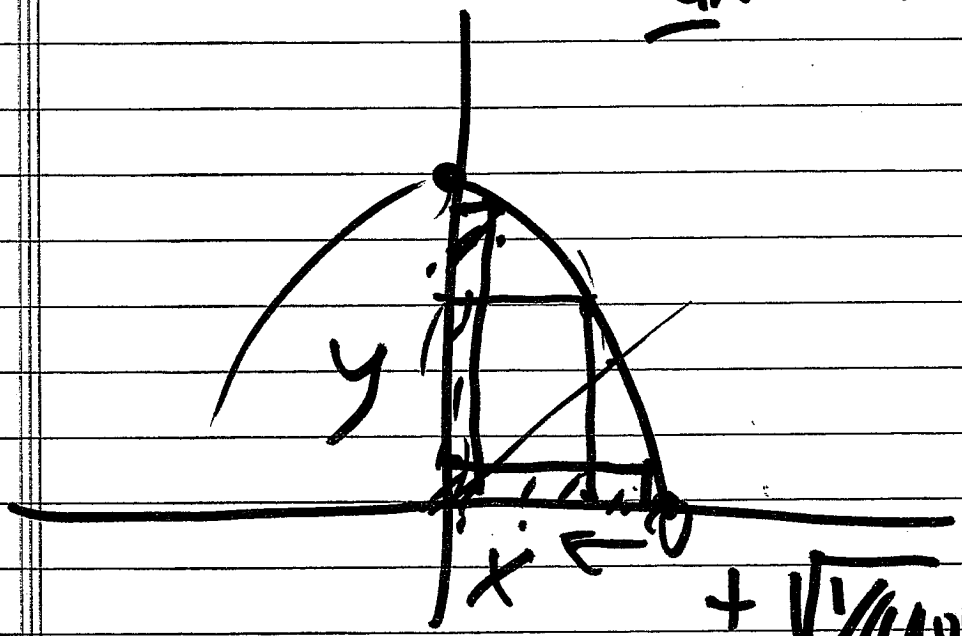
$-ax^2 + 1$

$f'' = .12$

$x = \pm$

$ax^2 = 1$

$x = \pm\sqrt{\frac{1}{a}}$



$+\sqrt{1/(.06)} = \sqrt{\frac{100}{6}} \approx \sqrt{16.6\ldots}$

4...

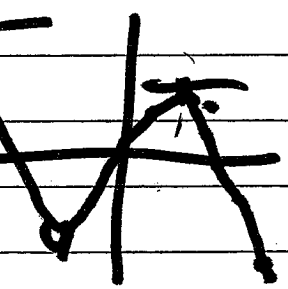
$A = xy = x \cdot (1 - ax^2)$

$= -ax^3 + x$

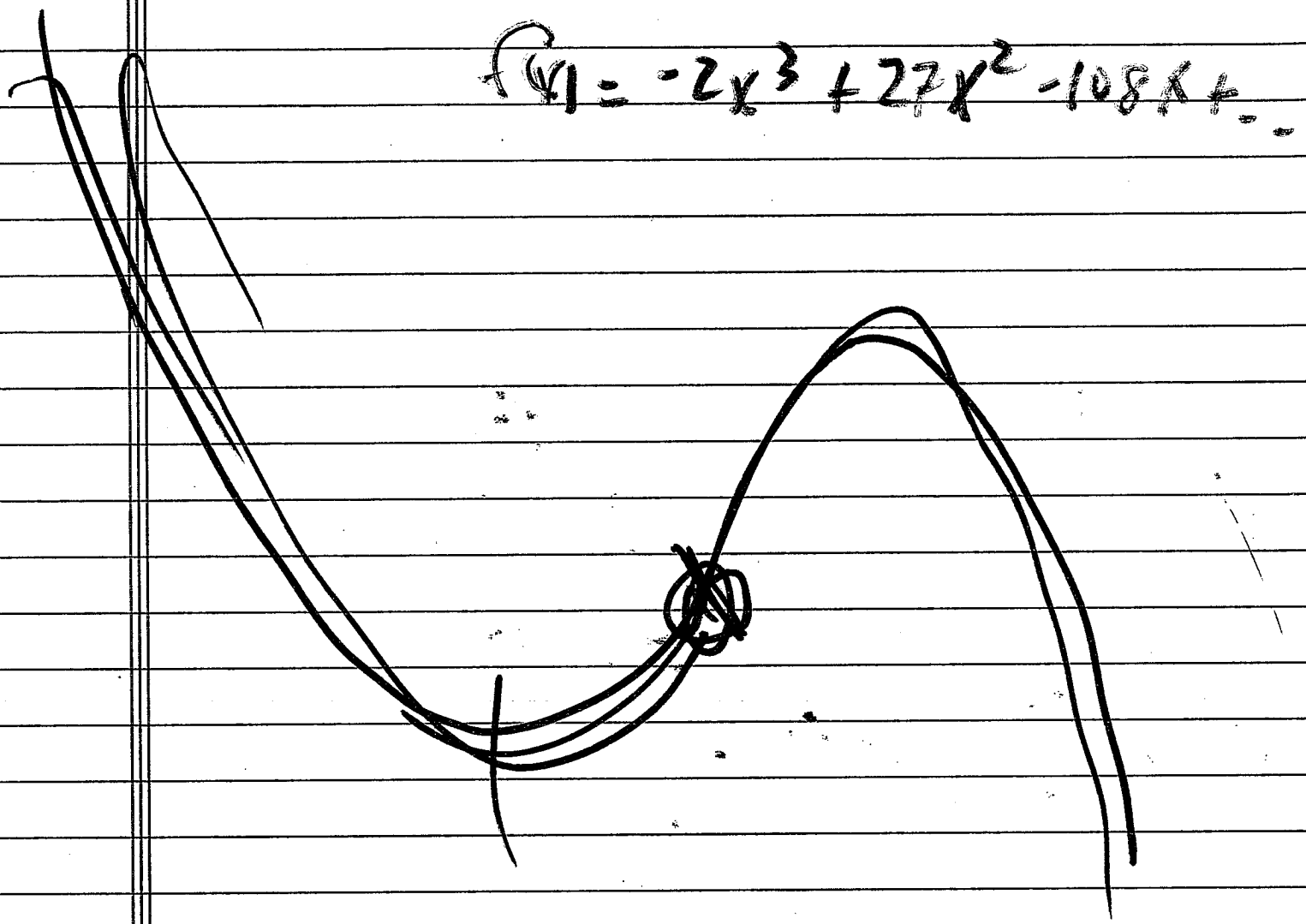
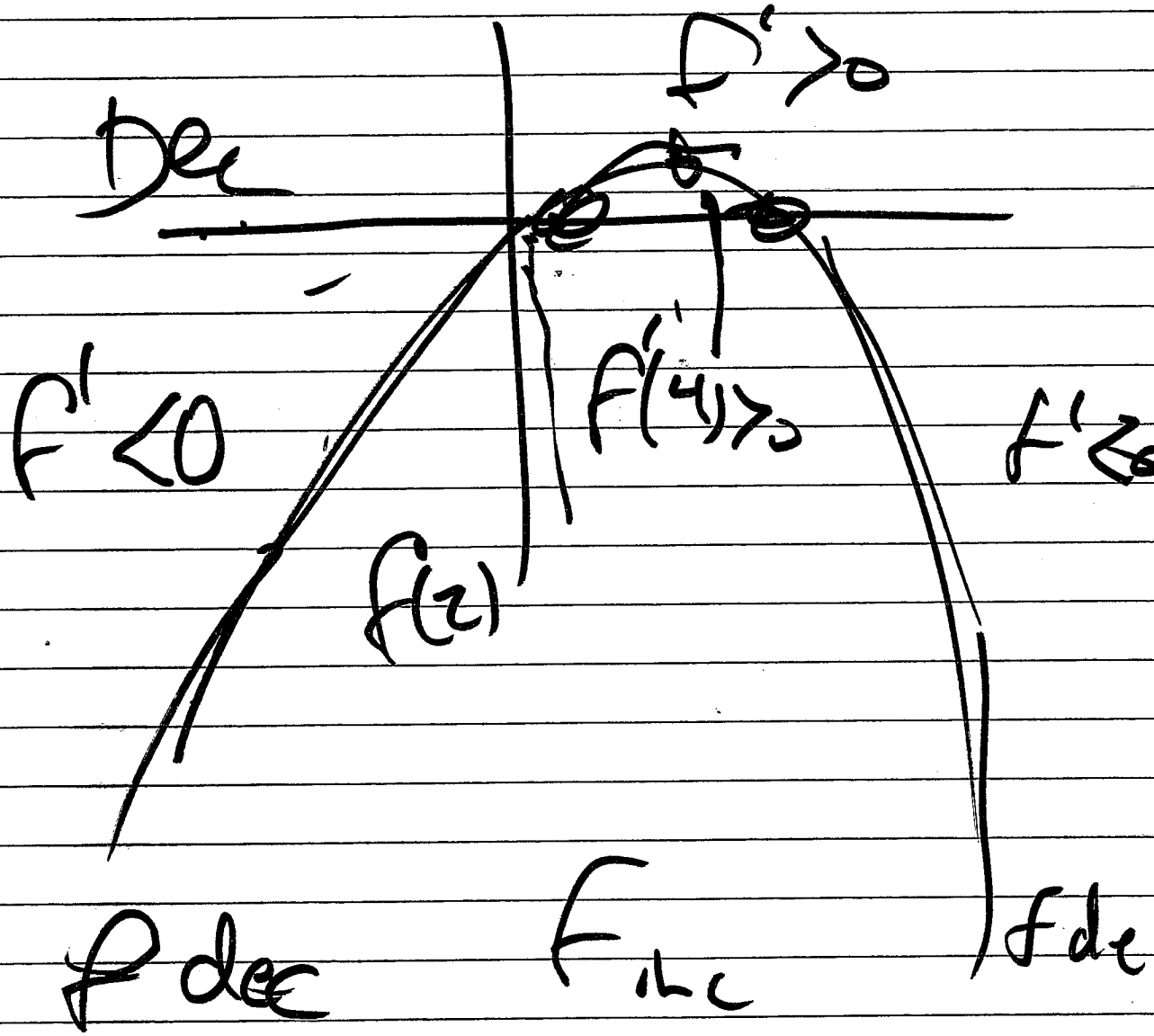
$A'(x) = -3ax^2 + 1 = 0$

$3ax^2 = 1 \quad x^2 = 1/3a$

$x = +\sqrt{1/(3a)}$



$f(x) = -2x^3 + 27x^2 - 108x + \_\_$



$f'(x) = -6x^2 + 54x - 105$