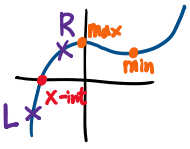
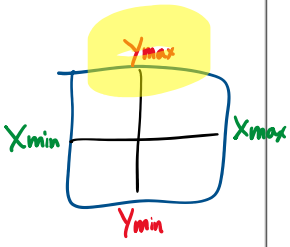
Printout

December 12, 2023 12:56 PM

FOM 12 CHAPTER 6 **Practice Test 2022 Edited**

1	Determine the location of the turning point and range of this polynomial function ***[ZStandard]*** $f(x) = -x^2 - 3x - 1$  Turning Pt (max) (-1.5, 1.25) Range: $y \le 1.25$ max
3	Determine the following characteristics of the polynomial function $j(x) = x^3 - 2x^2 + 3$. ***[ZStandard]*** Show your work. Casio : ROOT T:83/84 : Zero 2nd Cal → 2: Zero  • number of x-intercepts one X-int : X = -1 • y-intercept Value X=0 Y=3 • end behaviour Q3 → Q1 • domain $X \in \mathbb{R}$ • range $Y \in \mathbb{R}$ • location of turning points max (0, 3) min (1.33, 1.81)
4	Determine the following characteristics of the polynomial function $f(x) = 2(x-1)(x^2-4)$. ***[ZStandard]*** Show your work. $X_1 = -2$ $X_3 = 2$ $X_2 = 1$  • number of possible x-intercepts 3 • y-intercept Y=8 • end behaviour QIII → QI • domain $X \in \mathbb{R}$ • range $Y \in \mathbb{R}$ • ~~number of possible turning points~~ max / min max : (0.87, 12.1) min : (1.54, -1.76) Window
5	The growth of a tree can be modelled by the function $h(t) = 2.3t - 0.45$ $Y = 2.3X - 0.45$ Window Ymax = 50 Xmax = 30 where ***h*** represents the height in meters and ***t*** represents the time in years. Approximately how long will it take the tree to grow 32 m tall? time ⇒ X=? height Y=32 $Y_2 = 32$ X = 14.1 yr ? (Intersect)
6	Determine the equation of the quadratic regression function for the data.

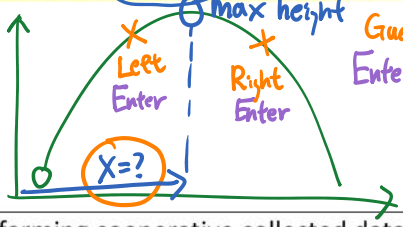
x	−6	−3	−1	1	1	3	5	8
y	35	46	50	53	51	47	36	11

$Y = -0.58X^2 - 0.39X + 52.11$

7 The path of a shot put thrown at a track and field meet is modelled by the quadratic function

$$h(d) = -0.048(d^2 - 20.7d - 26.28)$$

where h is the height in metres and d is the horizontal distance in metres.
What is the horizontal distance when the shot put is at its maximum height?



max
(10.35, 6.4)
x

horizontal (x)
10.35 m

8 A farming cooperative collected data showing the effect of different amounts of fertilizer, x, in hundreds of kilograms per hectare (kg/ha), on the yield of beets, y, in tonnes (t). Use the data below and quadratic regression to compare the possible yields of beets when the amount of fertilizer used is 1.50 kg/ha and 1.75 kg/ha. Show your work.

$y = -0.38x^2 + 1.219x + 0.215$

Fertilizer (kg/ha)	0	0.25	0.50	0.75	1.00	1.25
Yield (t)	0.22	0.49	0.74	0.92	1.05	1.15

$X_1 = 1.5$ $Y_1 = 1.191$ $X_2 = 1.75$ $Y_2 = 1.187$

9 Shane tracked the depth of the water at an ocean marina one afternoon. His data is summarized in the table below.

Time after 12 pm : L_1 0 1 2 3 4 6 7

Time of Day	12:00	13:00	14:00	15:00	16:00	18:00	19:00
Depth (ft)	12.3	12.7	13.3	13.8	14.3	14.6	14.3

L_2

Zoom → 9:zoom stat

a) Determine the equation for the cubic regression function that models this data. Let x be the number of hours since 12:00 and y be the depth in feet.

CubicReg L_1, L_2, Y_1 $y = -0.0151x^3 + 0.0947x^2 + 0.361x + 12.29$

b) Interpolate the depth of the water at 17:00. Show your work.

y=? (value) x=5 hrs after 12pm

↳ depth = 14.58 m

c) what is the depth of water at 10:30 that morning.

y= 12.01 m ? $x = -1.5$ ← 1.5 hr before 12 pm
Think