SHW 4 Problem 1. Tangent Slope Functions and Graphical Representations I

Lindsey
Emilee

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

Find the zeroes of f: $-3, 0, 2$

$x(x^2 + x - 6) = 0$
$x(x-2)(x+3) = 0$
$x = 0 \quad x = 2 \quad x = -3$

Determine the end behavior of f: down-up

Find the tangent slope function for f: tsf(x) = $3x^2 + 2x - 6$

Find the zeroes of the tsf function: $1.119, -1.787$

$3x^2 + 2x - 6 = 0$

$$\frac{-2 \pm \sqrt{(2)^2 - 4(3)(-6)}}{2(3)}$$

$$\frac{-2 \pm \sqrt{76}}{6} \rightarrow \frac{-1}{3} \pm \frac{\sqrt{76}}{6}$$

$-1/3 + 1.454 = 1.119$
$-1/3 - 1.454 = -1.787$

Use the information above to sketch the graph of f and to fill in the information below.

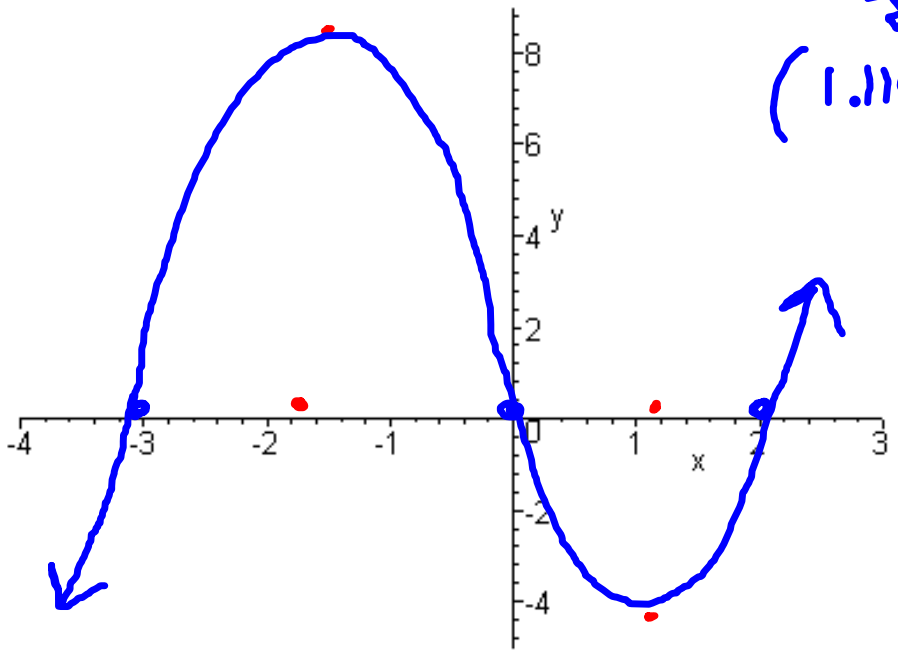
x-intercept(s), x = $-3, 0, 2$

x-coordinate(s) of bump(s) on f, x = $-1.787,\ 1.119$

bump1 on f = $(-1.787, f(-1.787))$ $(-1.787,$ 8.21)

bump2 on f =

bump3 on f = $(1.119, f(1.119))$ $(1.119, -4.061)$



SHW 4 Problem 2. Tangent Slope Functions and Graphical Representations I

Sam + Mark

$f(x) = -x^5 + 3x^3$

Find the zeroes of f: $-\sqrt{3}, 0, \sqrt{3}$

$-x^5 + 3x^3 = 0 \quad x^3(-x^2+3) \quad x = \pm\sqrt{3}$

$x^2 = 3$

Determine the end behavior of f: $-x^5$ = odd, neg. = UP, DOWN

Find the tangent slope function for f: tsf(x) = $-5x^4 + 9x^2$

Find the zeroes of the tsf function: $0, \pm\sqrt{9/5}$

$0 = -5x^4 + 9x^2$

$0 = x^2(-5x^2 + 9)$

$-5x^2 + 9 = 0$

$x = \sqrt{9/5}$

Use the information above to sketch the graph of f and to fill in the information below.

x-intercept(s), x = $\sqrt{3}, 0, -\sqrt{3}$

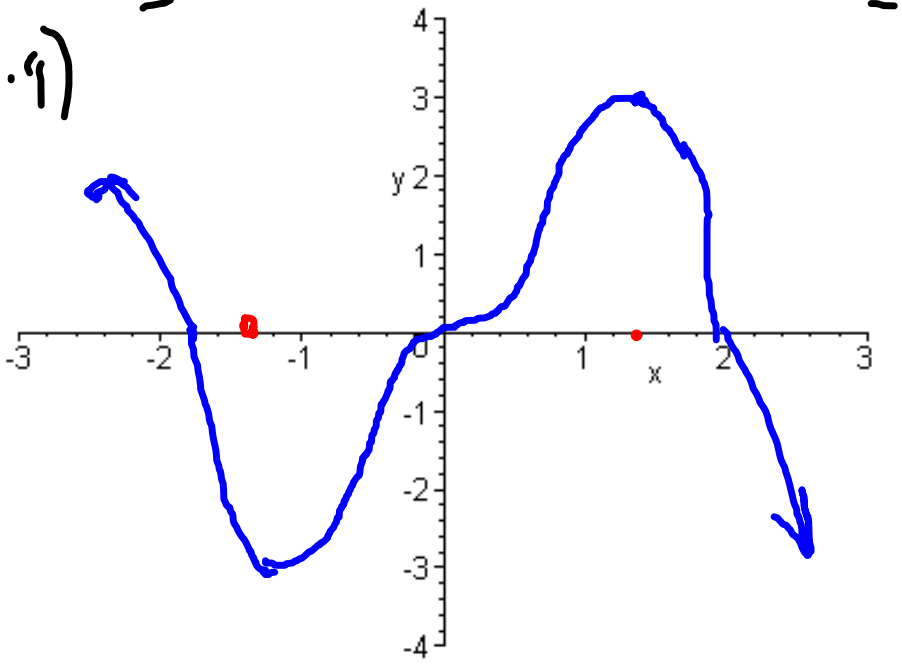
x-coordinate(s) of bump(s) on f, x = 1.342, 0, -1.342

bump1 on f = [-1.342, f(-1.342)] → (-1.342, -2.9)

bump2 on f =

bump3 on f =

[1.342, f(1.342)] ← (1.342, 2.9)



SHW 4 Problem 3. Tangent Slope Functions and Graphical Representations I

Brooke
Snaterra

$f(x) = -x^7 + 6x^5 - 9x^3$

Find the zeroes of f: 0, 0, 0, 1.732, −1.732

$0 = -x^7 + 6x^5 - 9x^3$ $x = 0$ $(x^2-3)(x^2-3)$

$0 = x^3(-x^4 + 6x^2 - 9)$ $x = \pm\sqrt{3}$

Determine the end behavior of f: Up Down

Find the tangent slope function for f: tsf(x) = $-7x^6 + 30x^4 - 27x^2$

Find the zeroes of the tsf function: 1.732, −1.732, 1.1338, −1.338, 0

$tsf(x) = -7x^6 + 30x^4 - 27x^2 = 0$ $u = 3, 1.285$

$0 = -x^2(7x^4 - 30x^2 + 27)$

$u = x^2$

$u^2 = x^4$ $7u^2 - 30u + 27 = 0$ $x = \pm 1.732$

$x = \pm 1.13$

Use the information above to sketch the graph of f and to fill in the information below.

x-intercept(s), x = 0, 0, 0.1732, -1.732

x-coordinate(s) of bump(s) on f, x = 0, 1.13, -1.13

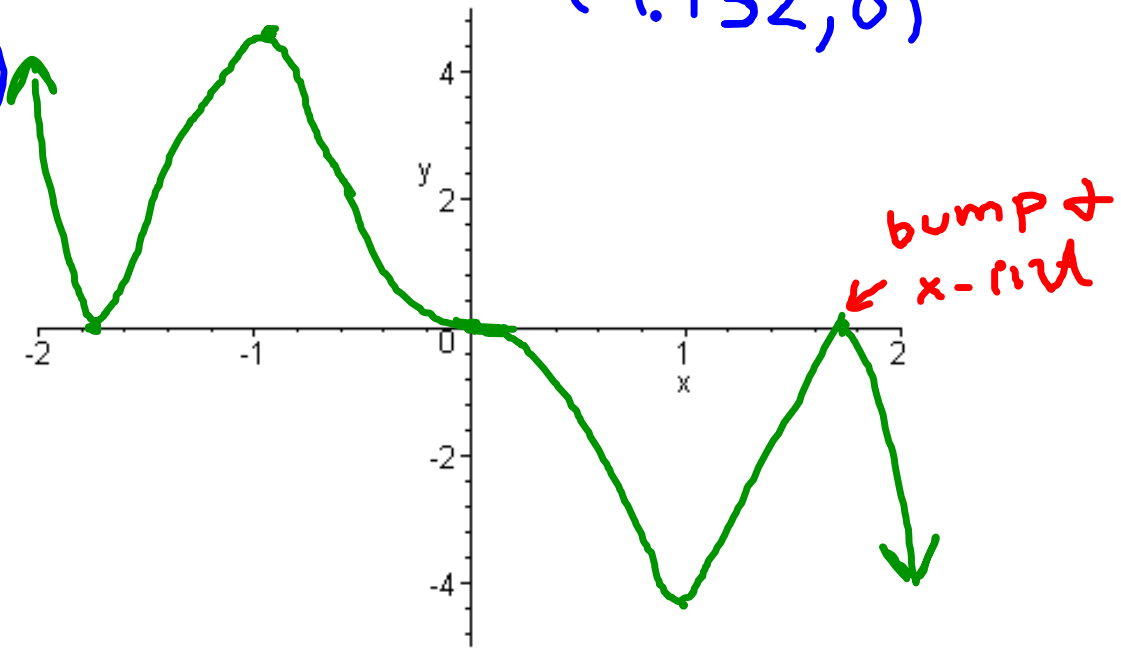
bump1 on f = (0, 0)

bump2 on f = (1.732, 0)

bump3 on f = (-1.732, 0)

bump 4: (1.13, -4.28)

bump 5: (-1.13, 4.28)



bump 4 x-int

SHW 4 Problem 4. Tangent Slope Functions and Graphical Representations I

$f(x) = x^4 + x^3 - 7x^2$

Find the zeroes of f: 2.1926, -3.195, 0, 0

ALAna:
KiKi

$x^2(x^2+x-7)=0$

$x = 2.1426$

-3.1926

Determine the end behavior of f: up-up

Find the tangent slope function for f: tsf(x) = $4x^3+3x^2-14x$

Find the zeroes of the tsf function: 0, 1.53, -2.28

$0 = 4x^3+8x^2-14x$

$0 = x(4x^2+3x-14)$ $x = 0$

$0 = \frac{-3 \pm \sqrt{(-3)^2-4(4)(-14)}}{2(4)}$

$x = 1.53$ $x = -2.28$

Use the information above to sketch the graph of f and to fill in the information below.

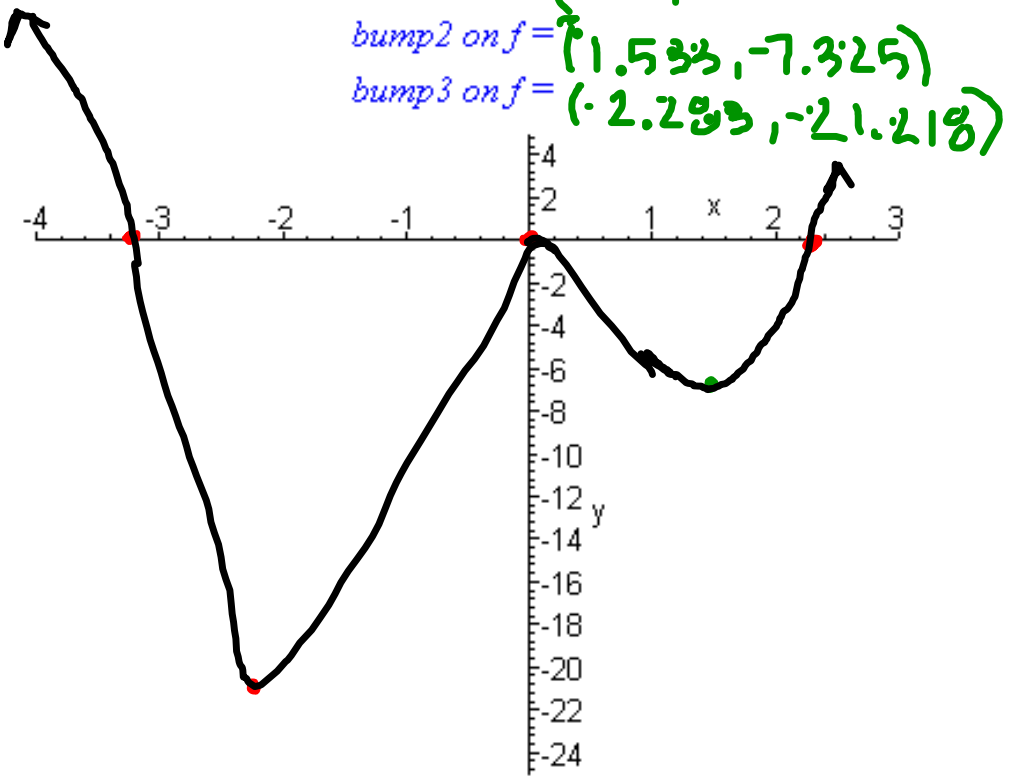
x-intercept(s), x = 0, -3.1926, 2.1926

x-coordinate(s) of bump(s) on f, x = 0, 1.533, -2.283

bump1 on f = (0, 0)

bump2 on f = (1.533, -7.325)

bump3 on f = (-2.283, -21.218)



SHW 4 Problem 5. Tangent Slope Functions and Graphical Representations I

$$f(x) = -x^6 + 6x^4 - 9x^2$$

Find the zeroes of f: _____

Determine the end behavior of f: _____

Find the tangent slope function for f: tsf(x) = _____

Find the zeroes of the tsf function: _____

Use the information above to sketch the graph of f and to fill in the information below.

x-intercept(s), x =

x-coordinate(s) of bump(s) on f, x =

bump1 on f =

bump2 on f =

bump3 on f =