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

Scott and Emily

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

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

$f(x) = 0$

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

$x(x^2 + x - 6) = 0$

$x = 0$

$(x+3)(x-2) = 0$ $x = -3, 2$

Determine the end behavior of f: Down_up ($x^3$)

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

Find the zeroes of the tsf function: $1.119, -1.786$

$tsf(x) = 0$

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

$x = \frac{-6 \pm \sqrt{6^2 - 4ac}}{2a}$

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

$x = \frac{-2 \pm \sqrt{76}}{6}$

$x = -1.786$

$x = 1.119$

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

Emily

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Scott

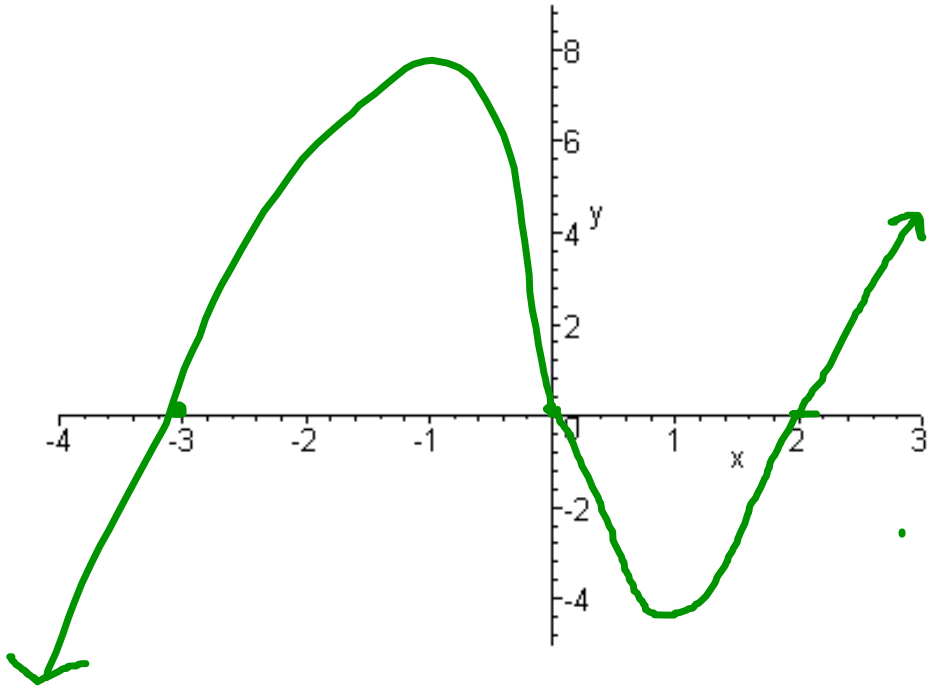
*x-intercept(s), x =* -3, 2, 0

*x-coordinate(s) of bump(s) on f, x =* -1.786, 1.119

*bump1 on f =* [-1.786, f(-1.786)] = [-1.786, 8.2]

*bump2 on f =* f(1.119) = -4.06

*bump3 on f =*



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

Burke

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

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

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

$x^3=0 \quad x=0$

Determine the end behavior of f: up – down

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

Find the zeroes of the tsf function: $-1.34, 0, 1.34$

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

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

$-5x^2=-9$

$x^2=9/5$

$x=\pm 1.34$

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

Bumps

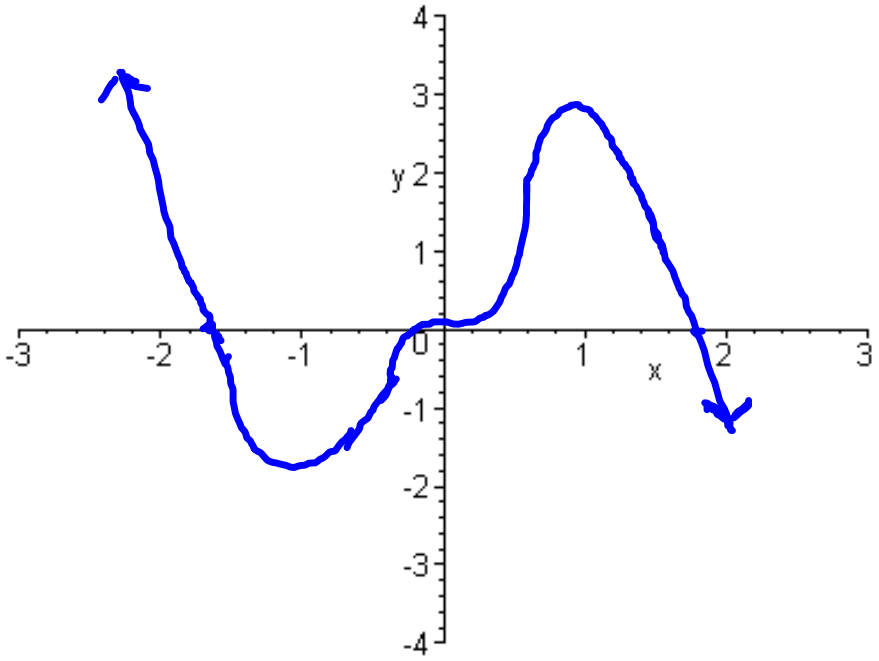
*x-intercept(s), x =* -1.73, 0, 1.73

*x-coordinate(s) of bump(s) on f, x =* -1.34, 0, 1.34

*bump1 on f =* (-1.34, -2.74)

*bump2 on f =* (0, 0)

*bump3 on f =* (1.34, 2.9)



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

Samah & Chloe

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

Find the zeroes of f: $-1.73, -1.73, 0, 0, 1.73, 1.73$

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

$= x^3(-x^4 + 6x^2 - 9) \rightarrow 0 = x^3$

$u = x^2$

$0 = -x^4 + 6x^2 - 9 \rightarrow u^2 + 6u - 9$

$0 = (u-3)(u-3) \rightarrow x = \sqrt{3} = \pm 1.73$

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: $\pm 1.13, \pm 1.73, 0$

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

$-x^2 = 0$

$x = 0$

$7u^2 - 30u + 27 = 0$

$u = \frac{30 \pm \sqrt{30^2 - 4(7)(27)}}{2(7)}$

$x = \pm\sqrt{u}$

$\pm 1.73$

$\pm 1.13$

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

up-down

*x-intercept(s), x =*

*x-coordinate(s) of bump(s) on f, x =* -1.73, -1.73, 0, 0, 1.73, 1.73

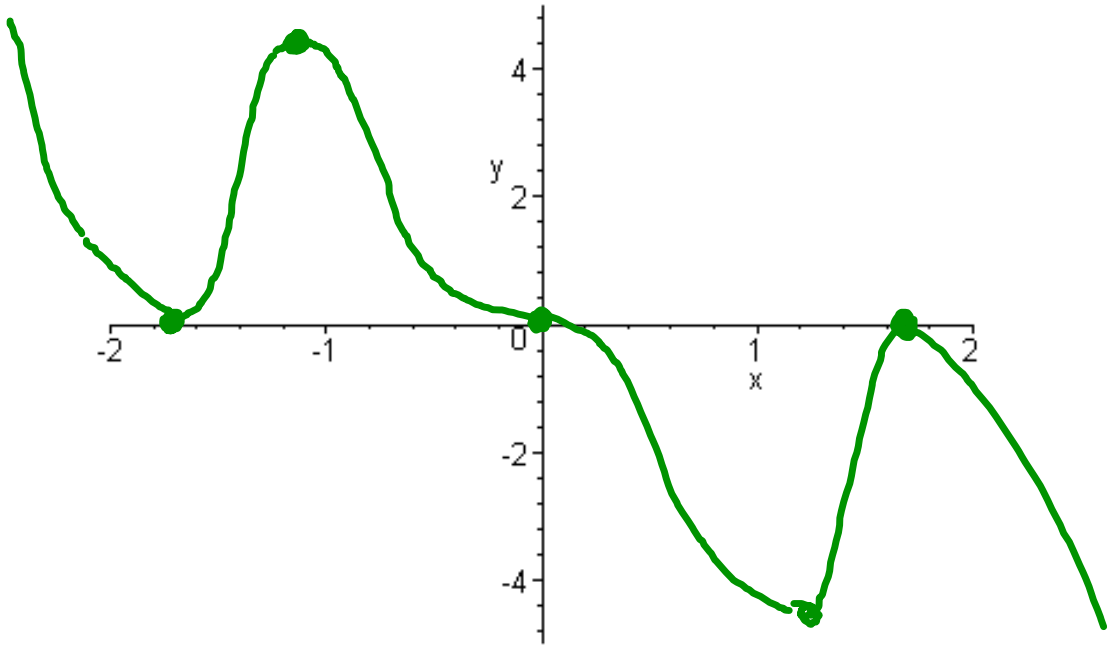
*bump1 on f =* (-1.73, 0)

*bump2 on f =* (-1.13, 4.28)

*bump3 on f =* (0, 0)

Bump 4 = (1.13, -4.28)

Bump 5 = (1.73, 0)



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

Brittany
Madeline

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

Find the zeroes of f: $-3.1925, 0, 2.1925$

$f(x) = 0$

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

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

$x = \frac{-1 \pm \sqrt{1^2 - 4(1)(-7)}}{2}$

$x = \frac{-1 \pm \sqrt{29}}{2}$

$x = \frac{-1 \pm 5.385}{2}$

$x = \frac{-1 + 5.385}{2}$

$x = 2.1925$

$x = \frac{-1 - 5.385}{2}$

$x = -3.1925$

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: $-2.2830, 0, 1.533$

$tsf(x) = 0$

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

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

$x = \frac{-3 \pm \sqrt{9 - 4(4)(-14)}}{8}$

$x = \frac{-3 \pm 15.2643}{8}$

$x = \frac{-3 + 15.2643}{8}$

$x = 1.533$

$x = \frac{-3 - 15.2643}{8}$

$x = -2.2830$

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

up-up

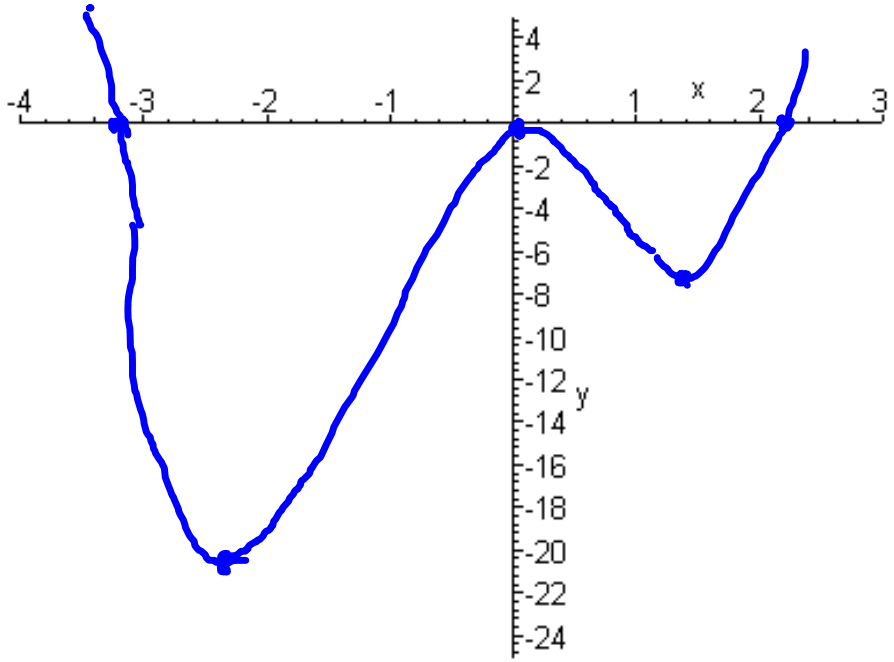
*x-intercept(s), x =* 0, 2.193, -3.193

*x-coordinate(s) of bump(s) on f, x =* 0, 1.53, -2.28

*bump1 on f =* (0, 0)

*bump2 on f =* (1.53, -7.325)

*bump3 on f =* (-2.28, -21.23)



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

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

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

$f(x) = 0$

$-x^6 + 6x^4 - 9x^2 = 0$

$-x^2(x^4 - 6x^2 + 9) = 0$

$x = 0$

$(x^4 - 6x^2 + 9) = 0$

$(x^2 - 3)(x^2 - 3)$

$x = \pm\sqrt{3}$ $x = \pm\sqrt{3}$

Determine the end behavior of f: down - down

Find the tangent slope function for f: tsf(x) = $-6x^5 + 24x^3 - 18x$

Find the zeroes of the tsf function: 0, $\pm\sqrt{3}$, $\pm\sqrt{1}$ = 0, ±1.73, ±1

$tsf = 0$

$0 = -6x^5 + 24x^3 - 18x$

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

$-6x = 0$

$x = 0$

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

$(x^2 - 3)(x^2 - 1) = 0$

$x = \pm\sqrt{3}$ $x = \pm\sqrt{1}$

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 =*