

Section 5.1 Polynomial functions

1) $f(x) = (x - 3)^2(x + 1)$

a) $(3,0)$ multiplicity 2 (even) $(-1,0)$ multiplicity 1 (odd)

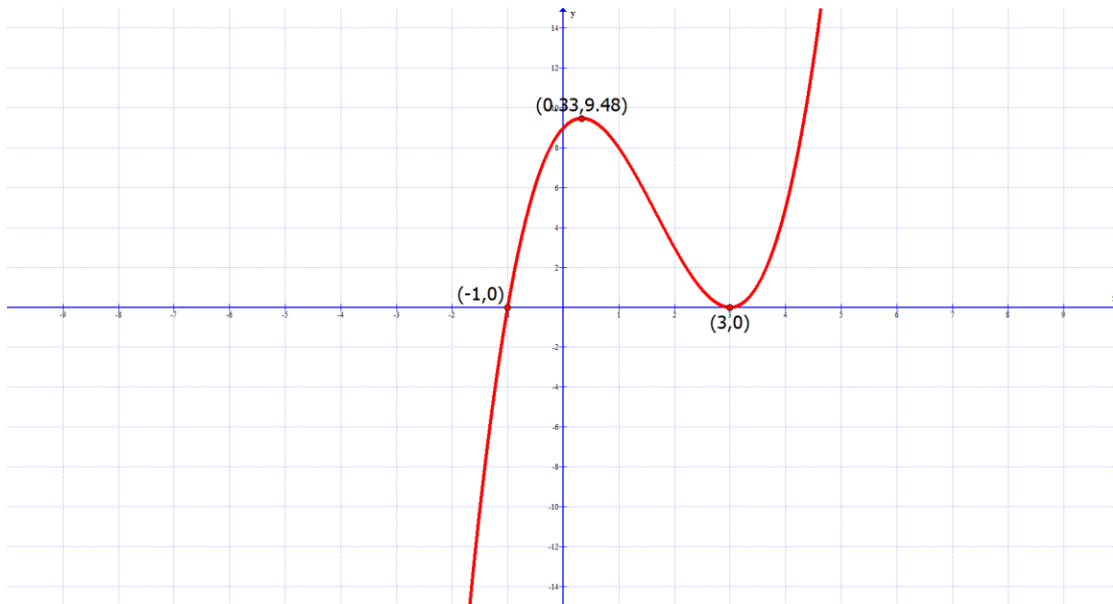
b) touches x - axis at $(3,0)$ crosses the x - axis at $(1,0)$

c) maximum 2 turning points

d) Sketch a graph and approximate the turning points, also label the x-intercepts

e) resembles $f(x) = x^3$

f) increasing $(-\infty, 0.33) \cup (3, \infty)$ decreasing $(0.33, 3)$



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

a) $(3,0)$ multiplicity 3 (odd) $(-4,0)$ multiplicity 1 (odd)

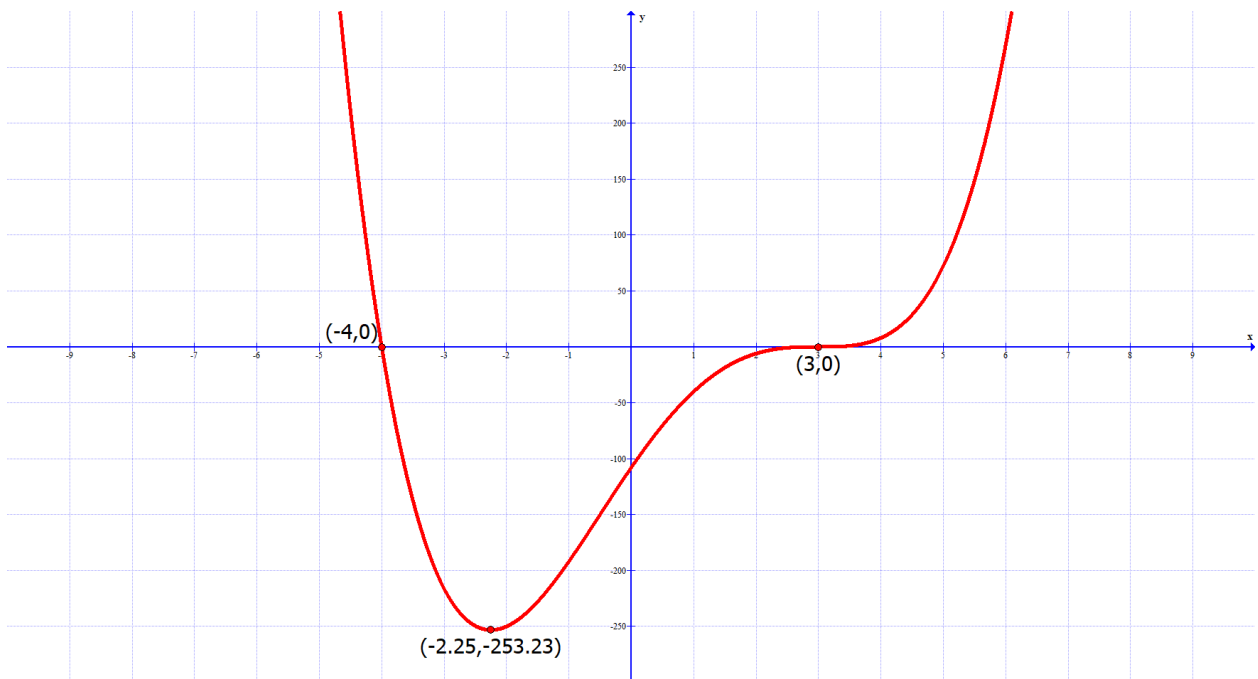
b) crosses at $(3,0)$ crosses at $(-4,0)$

c) maximum 3 turning points

d) Sketch a graph and approximate the turning points, also label the x-intercepts

e) resembles $f(x) = x^4$

f) increasing $(-2.25, 3) \cup (3, \infty)$ decreasing $(-\infty, -2.25)$



5) $f(x) = (x + 3)(x - 3)(3x + 21)$

a) $(-3,0)$ multiplicity 1 (odd)

$(3,0)$ multiplicity 1 (odd)

$(-7,0)$ multiplicity 1 (odd)

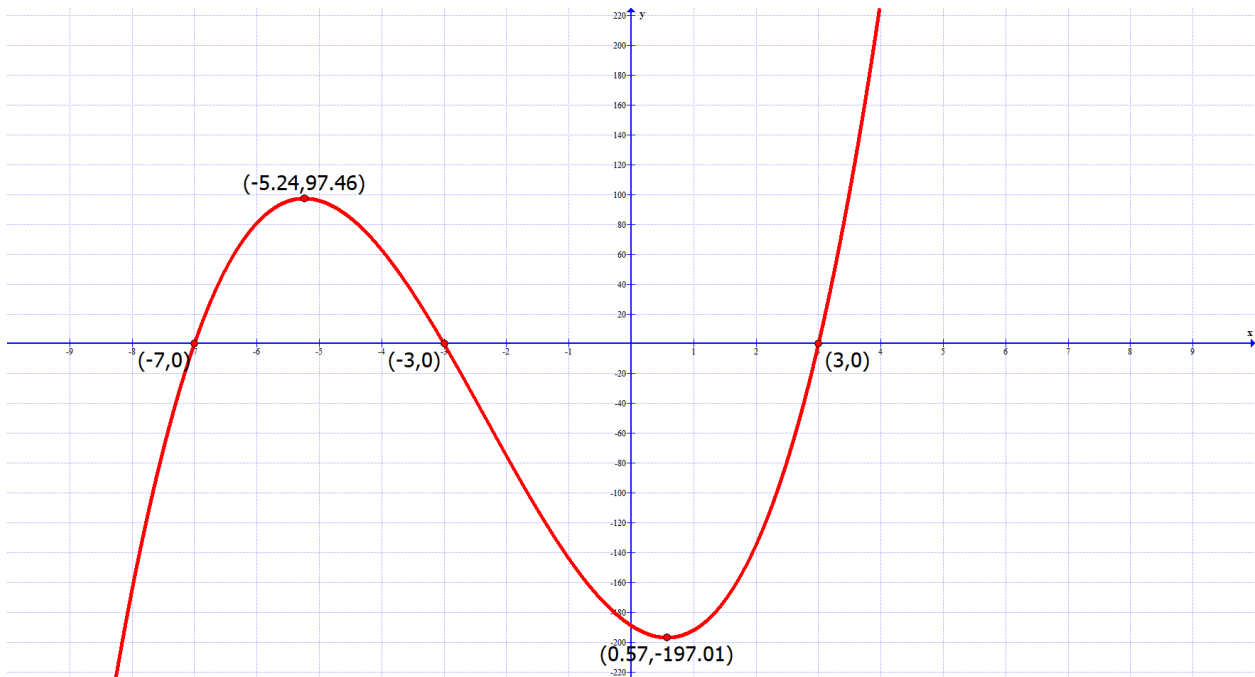
b) crosses at each x – intercept

c) maximum 2 turning points

d) Sketch a graph and approximate the turning points, also label the x-intercepts

e) resembles $f(x) = 3x^3$

f) increasing $(-\infty, -5.24) \cup (0.57, \infty)$ decreasing $(-5.24, 0.57)$



7) $f(x) = (x + 3)^2(2x - 10)$

a) $(-3,0)$ multiplicity 2 (even) $(5,0)$ multiplicity 1 (odd)

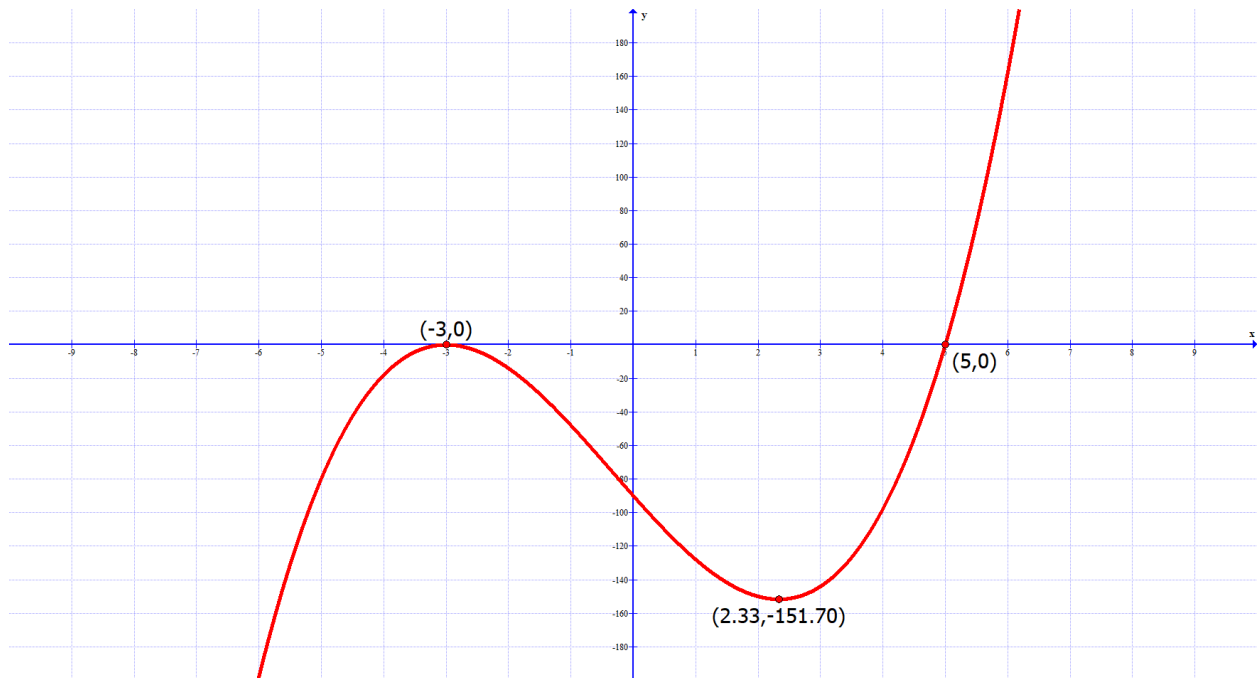
b) $(-3,0)$ touches $(5,0)$ crosses

c) maximum 2 turning points

d) Sketch a graph and approximate the turning points, also label the x-intercepts

e) resembles $f(x) = 2x^3$

f) increasing $(-\infty, -3) \cup (2.33, \infty)$ decreasing $(-3, 2.33)$



9) $f(x) = x^2 + 6x - 7$

a) $(-7,0)$ multiplicity 1 (odd) $(1,0)$ multiplicity 1 (odd)

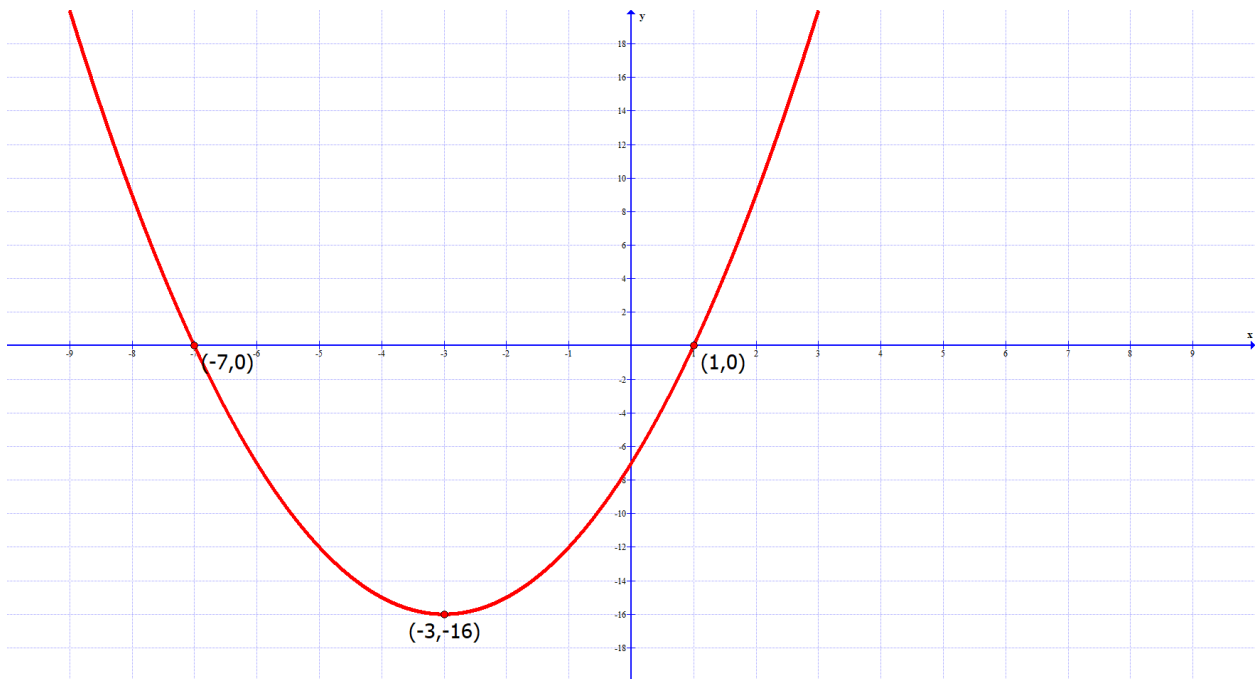
b) graph crosses the x – axis at both x – intercepts

c) maximum 1 turning point

d) Sketch a graph and approximate the turning points, also label the x -intercepts

e) resembles $f(x) = x^2$

f) increasing $(-3, \infty)$ decreasing $(-\infty, 3)$



11) $f(x) = x^2 - 4$

a) $(-2,0)$ multiplicity 1 (odd) $(2,0)$ multiplicity 1 (odd)

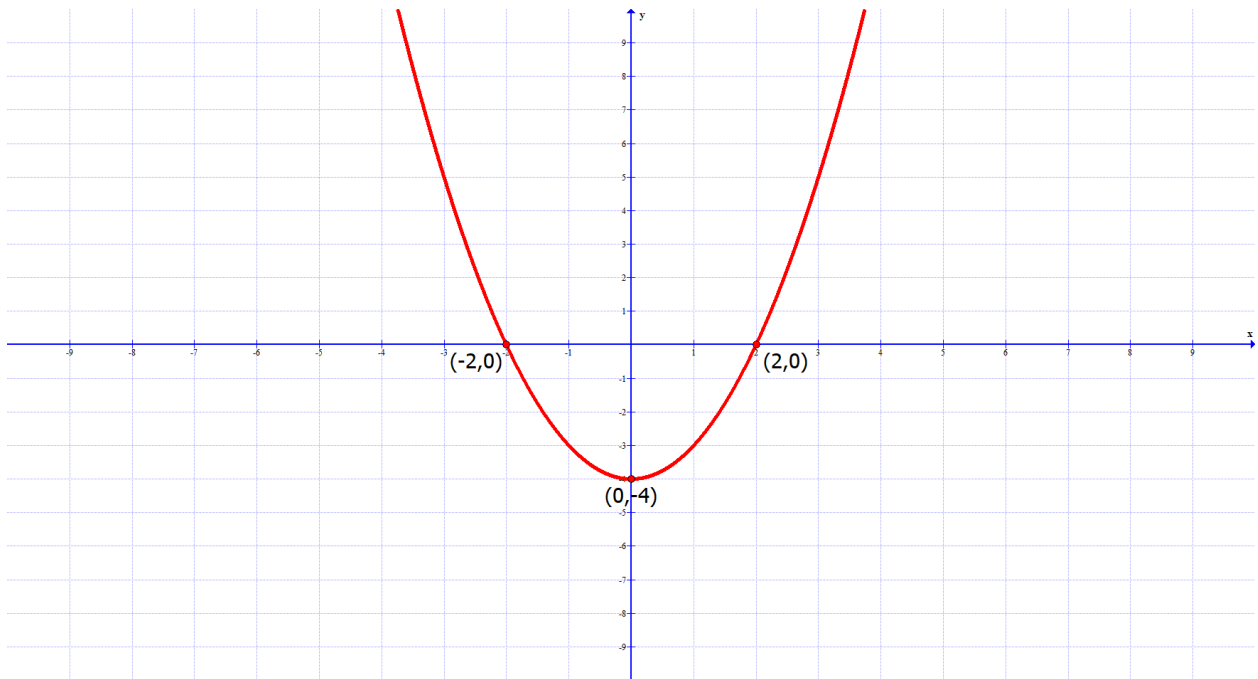
b) graph crosses the x – axis at both x – intercepts

c) maximum 1 turning point

d) Sketch a graph and approximate the turning points, also label the x -intercepts

e) resembles $f(x) = x^2$

f) increasing $(0, \infty)$ decreasing $(-\infty, 0)$



13) $f(x) = -3x^3 - 3x^2 + 18x$

a) $(-3,0)$ multiplicity 1 (odd)

$(0,0)$ multiplicity 1 (odd)

$(2,0)$ multiplicity 1 (odd)

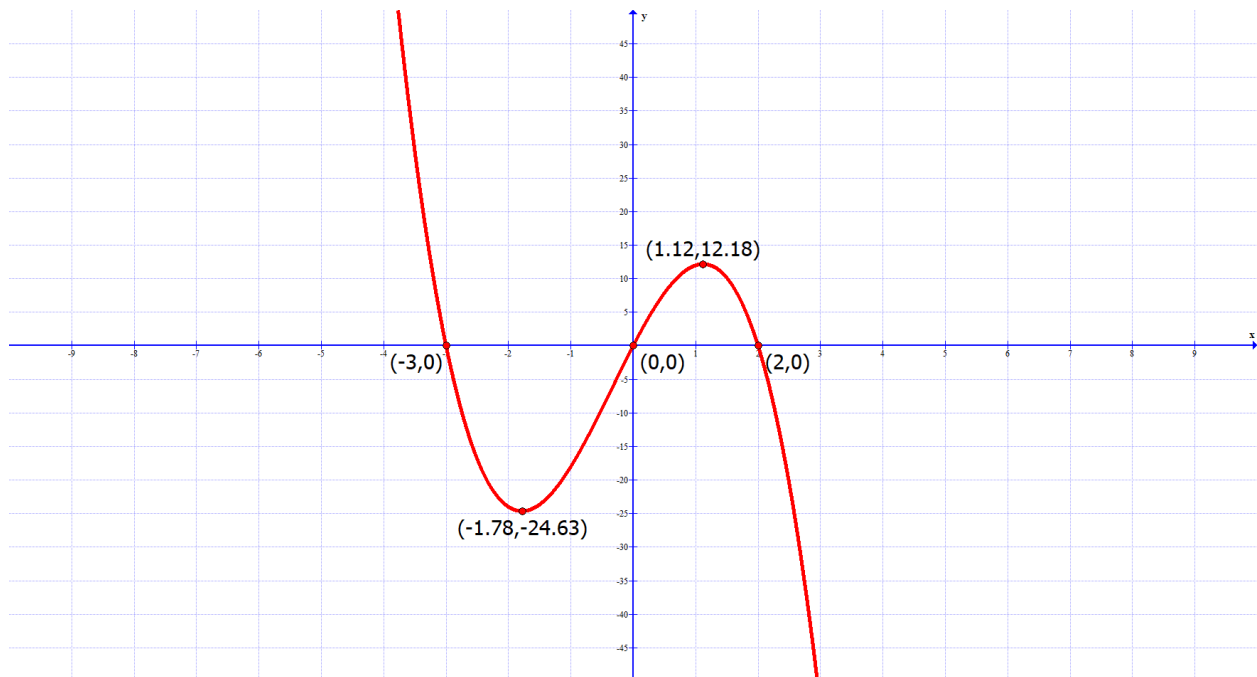
b) crosses at each x – intercept

c) maximum 2 turning points

d) Sketch a graph and approximate the turning points, also label the x-intercepts

e) resembles $f(x) = -3x^3$

f) increasing $(-1.78, 1.12)$ decreasing $(-\infty, -1.78) \cup (1.12, \infty)$



15) $f(x) = 3x^4 - 12x^2$

a) $(-2,0)$ multiplicity 1 (odd) $(0,0)$ multiplicity 2 (even)

$(2,0)$ multiplicity 1 (odd)

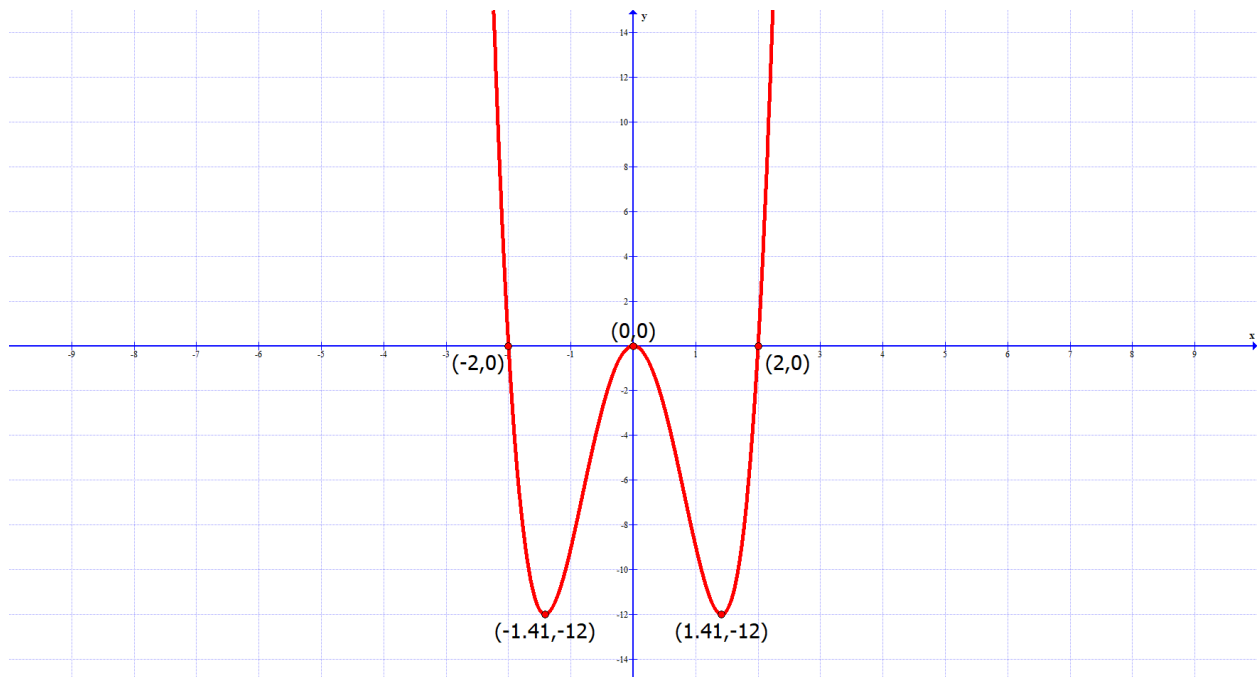
b) crosses at $(2,0)$ and $(-2,0)$ touches at $(0,0)$

c) maximum 3 turning points

d) Sketch a graph and approximate the turning points, also label the x-intercepts

e) resembles $f(x) = 3x^4$

f) increasing $(-1.41,0) \cup (1.41,\infty)$ decreasing $(-\infty,-1.41) \cup (0,1.41)$



$$17) f(x) = 2(x - 3)(x + 4)$$

$$19) f(x) = -2(x - 4)(x + 3)$$

$$21) f(x) = 2(x + 4)(x - 3)^2$$

$$23) f(x) = -4(x + 3)(x - 4)^2$$