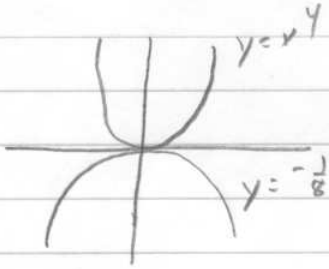
Sec. 3.1. 3, 10, 14, 15, 20, 21, 22, 24, 26, 29, 30, 36, 37, 41, 50, 51, 52

3) 

Graph of $y = -\frac{1}{8}x^4$ is a vertical reflection and compression by $\frac{1}{8}$ of graph of $y = x^4$

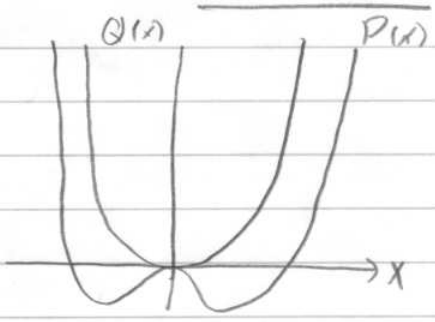
10) a) Compressed vertically by $\frac{1}{2}$, shifted right by 2, down by 8, as compared to $y = x^4$.

b) $y \to \infty$ as $x \to \infty$, $y \to \infty$ as $x \to -\infty$.

c) $\frac{1}{2}(x-2)^4 - 8 = 0 \to \frac{1}{2}(x-2)^4 = 8 \to (x-2)^4 = 16$

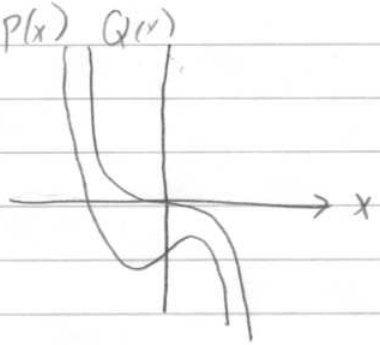
$\to x - 2 = \pm 2$

$\to x = 4, 0$

14) 

$y \to \infty$ as $x \to \infty$

$y \to \infty$ as $x \to -\infty$

15) 

$y \to \infty$ as $x \to -\infty$

$y \to -\infty$ as $x \to \infty$

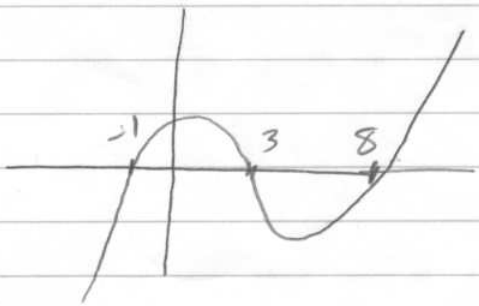
20) Could not be a polynomial. Graph does not grow without bound as $x \to \infty$ and $x \to -\infty$.

21) Could not be a polynomial. The graph is not continuous.

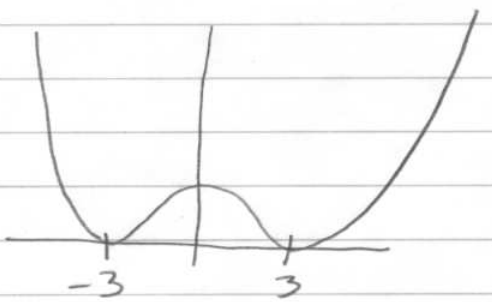
22) Could not be a polynomial. The function has a "cusp".

24) This could be a polynomial. There are 4 turning points, so it must have degree at least 5. $y \to -\infty$ as $x \to \infty$, so the leading term must have a negative coefficient.

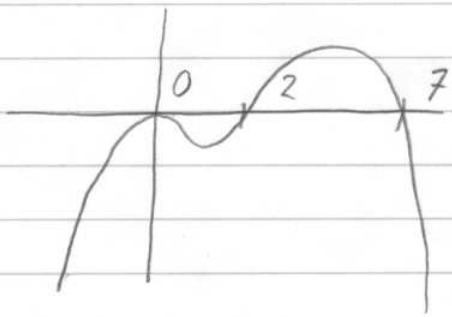
26)



29)



30)



36) a) $y \to \infty$ as $x \to \infty$, $y \to -\infty$ as $x \to -\infty$

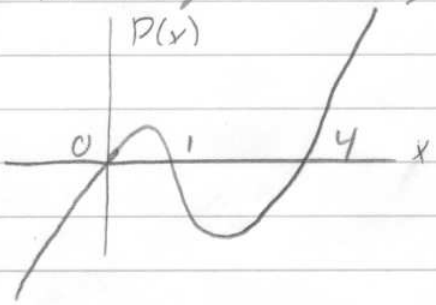
b) $x^3 - 5x^2 + 4x = 0$

$x(x^2 - 5x + 4) = 0$

$x(x-4)(x-1) = 0$

$\to$ x-intercepts: $x = 0, 1, 4$

c)



37) a) $y \to -\infty$ as $x \to \infty$, $y \to -\infty$ as $x \to -\infty$

b) $-x^4 + 4x^3 + 21x^2 = 0$

$-x^2(x^2 - 4x - 21) = 0$

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

$\to$ x-intercepts: $x = -3, 0, 7$

c)

41) a) $y \to \infty$ as $x \to \infty$, $y \to \infty$ as $x \to -\infty$

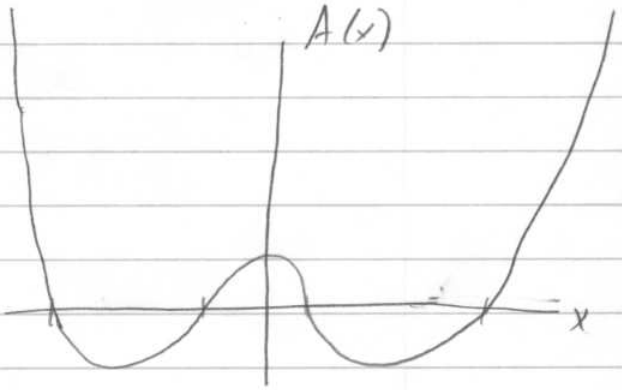
b) $(x^2)^2 - 9(x^2) + 8 = 0$

$(x^2 - 8)(x^2 - 1) = 0$

$(x - \sqrt{8})(x + \sqrt{8})(x-1)(x+1) = 0$

$\to$ x-intercepts: $x = \pm\sqrt{8}, \pm 1$

c)



50) $x^3 - 8x^2$. The polynomial has odd degree, so the end behavior should be opposite as $x \to \infty$ and $x \to -\infty$. The graph does not show this, so it cannot be a complete graph.

51) $x^4 + 12x^3 - 4x^2 - 48x$. The degree is even, so the end behavior should be the same as $x \to \infty$ and as $x \to -\infty$. The graph does not show this, so it cannot be the complete graph.

52) $x^4 - 25x^2 + 40$. The leading term is positive and the degree is even, so $y \to \infty$ as $x \to \infty$ and as $x \to -\infty$. The graph does not show this.