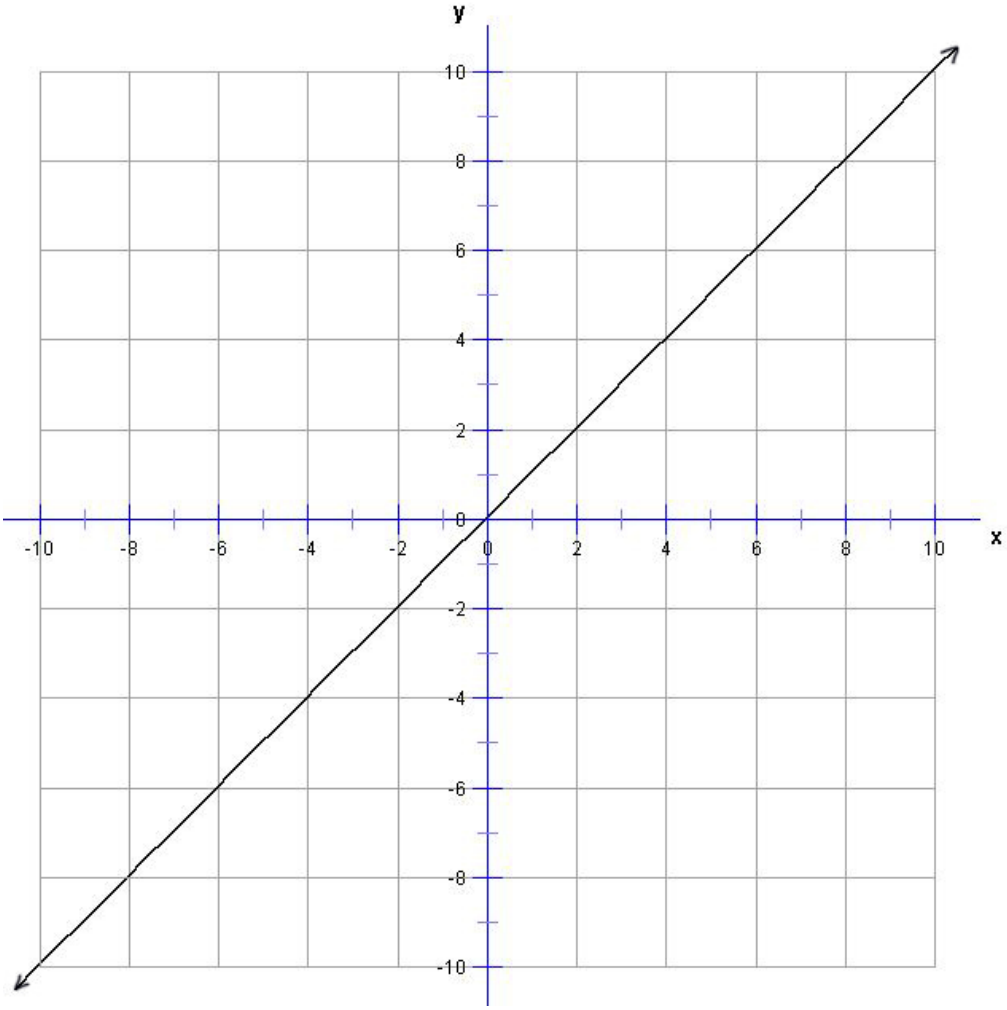
Pre-Calculus Homework #6 – Answer Key

1) $(f-g)(x) = -6x^2 - 9x + 8$ $\quad (g \cdot f)(x) = -24x^3 + 22x^2 + 39x - 7$

$(g \circ f)(x) = 96x^2 - 356x + 328$ $\quad (g / f)(-8m) = \dfrac{384m^2 - 40m - 1}{32m + 7}$

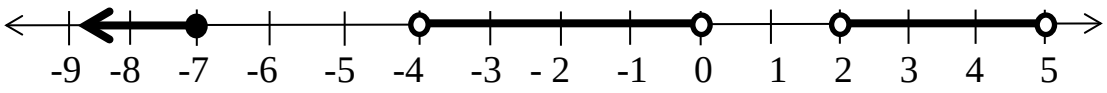
2) Symmetric to the origin and it is odd. $\quad y = -3(x-9) - 4 \gg y = -3x + 23$



3) $V = -32(x-2)^2 + 128$ $\quad$ Length of Side = 2 $\quad$ Volume = 128

4) $\dfrac{-10x^2}{a} + 10x + \dfrac{14x}{a} - 5a - 7 - \dfrac{18}{a}$

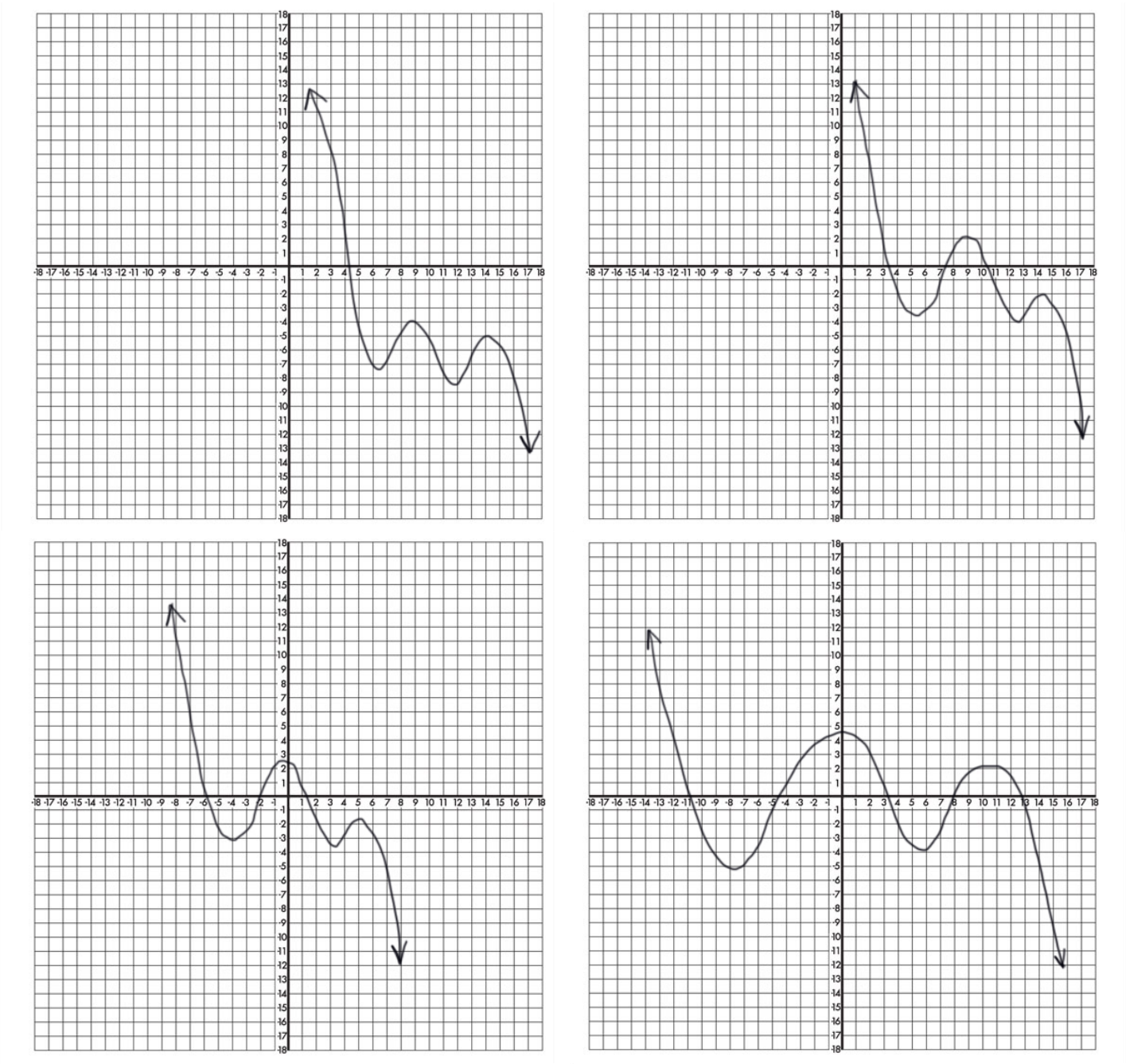
5) $x \le -7$ or $-4 < x < 0$ or $2 < x < 5$



6) 4 pm

7)

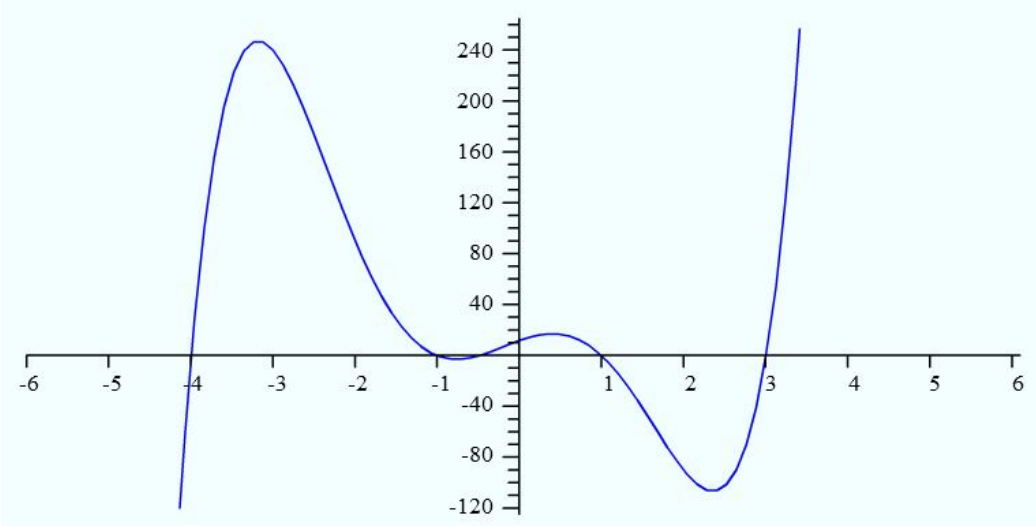
Positive Real Roots	Negative Real Roots	Imaginary Roots
1	0	4
3	0	2
1	2	2
3	2	0



8) oblique asymptote: $y = 4x + 45$ vertical asymptotes: $x = 15, x = -2$

9) $\pm 1, 2, 3, 4, 6, 12, \frac{1}{2}, \frac{3}{2}$

zeros $= \frac{-1}{2}, 1, -1, 3, -4$ $\quad f(x) = (2x+1)(x-1)(x+1)(x-3)(x+4)$

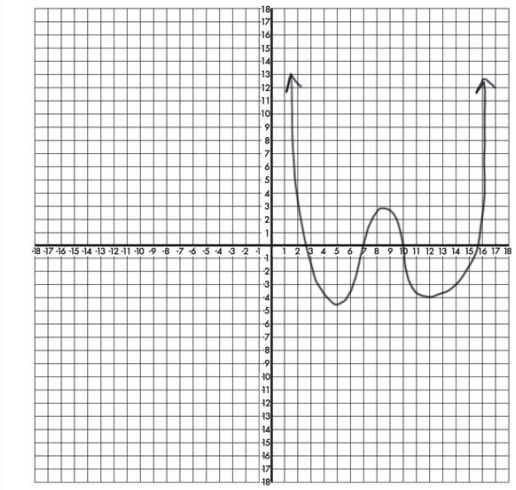


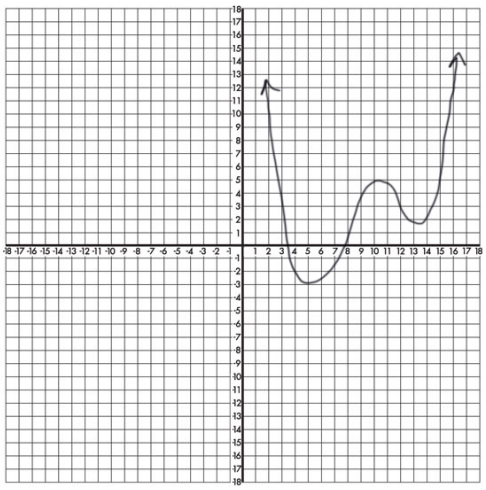
10) 1 pm

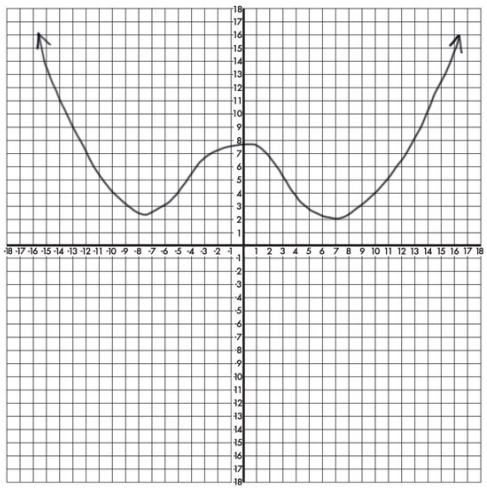
11)

Positive Real Roots	Negative Real Roots	Imaginary Roots
4	0	0
2	0	2
0	0	4

12)



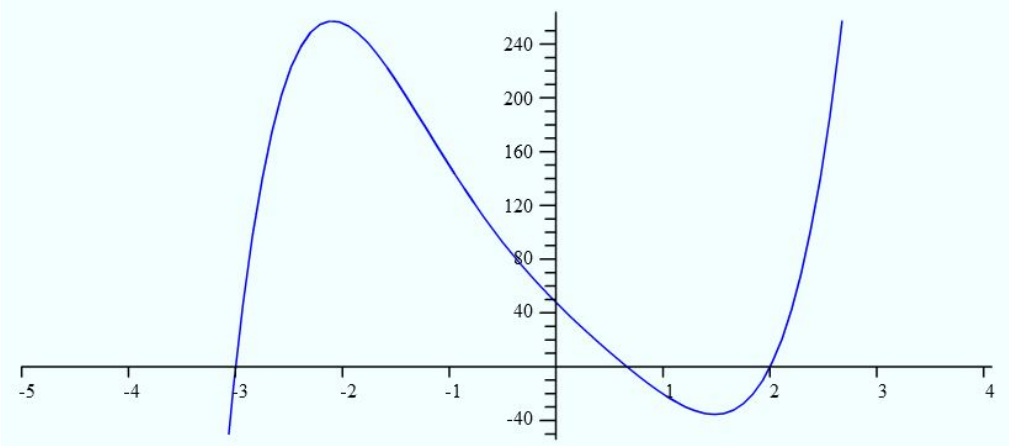




12) horizontal asymptote: $y = \frac{4}{3}$ vertical asymptotes: $x = \frac{5}{6}, x = -3$

13) $\pm 1, 2, 3, 4, 6, 8, 12, 16, 24, 48, \frac{1}{3}, \frac{2}{3}, \frac{4}{3}, \frac{8}{3}, \frac{16}{3}$

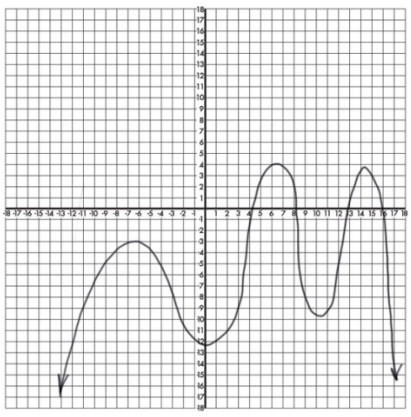
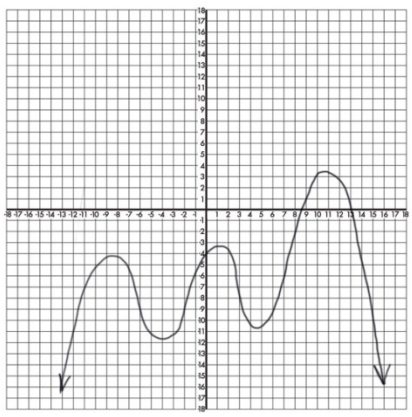
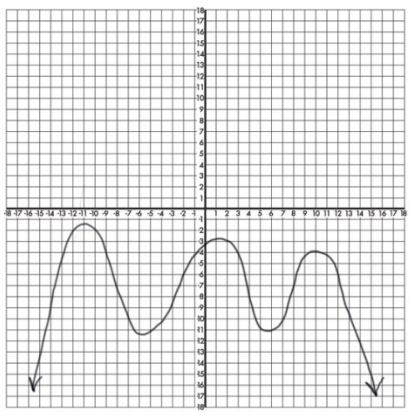
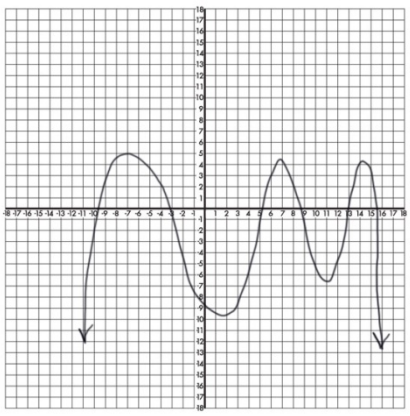
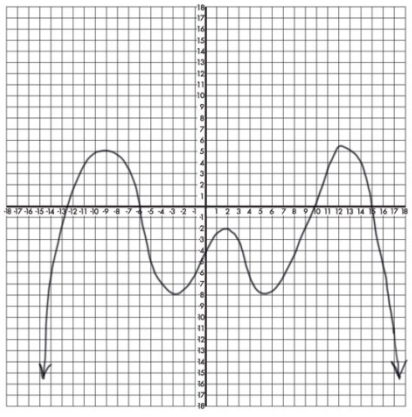
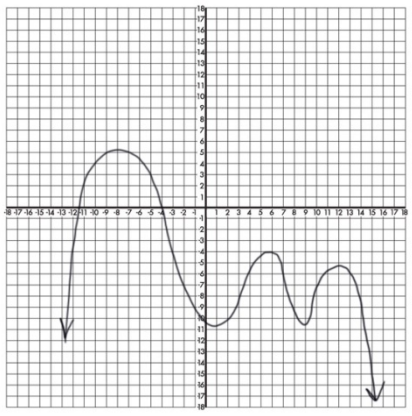
zeros $= \frac{2}{3}, 2, -3, 2i, -2i$ $\quad f(x) = (3x-2)(x-2)(x+3)(x-2i)(x+2i)$



14) 3 pm

15)

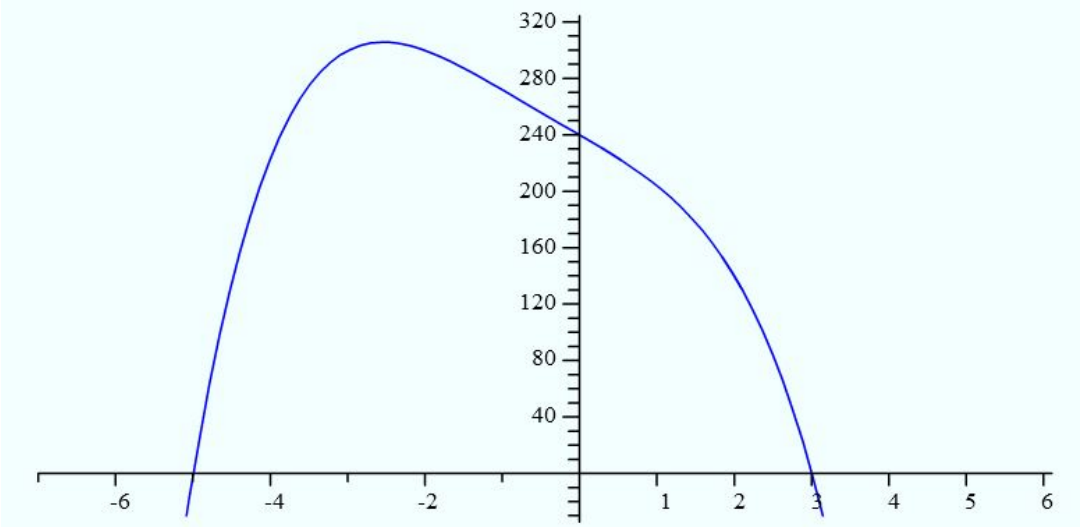
Positive Real Roots	Negative Real Roots	Imaginary Roots
4	0	2
2	0	4
0	0	6
4	2	0
2	2	2
0	2	4

16) horizontal asymptote: $y = 0$ vertical asymptotes: $x = \frac{9}{4}, x = \frac{-9}{8}, x = 0$

17) $\pm 1, 2, 3, 4, 5, 6, 8, 10, 12, 15, 16, 20, 24, 30, 40, 48, 60, 80, 120, 240$

zeros $= 3, -5, 4i, -4i$ $\quad f(x) = (x-3)(x+5)(x-4i)(x+4i)$



18) 3 pm

19) oblique asymptote: $y = 2x - 15$ vertical asymptotes: $x = \frac{4}{3}, x = -6$

20) $\pm 1, 2, 3, 5, 6, 9, 10, 15, 18, 30, 45, 90, \frac{1}{2}, \frac{3}{2}, \frac{5}{2}, \frac{9}{2}, \frac{15}{2}, \frac{45}{2}$

zeros $= \frac{5}{2}, -1, 2, -3, \sqrt{3}, -\sqrt{3}$ $\quad f(x) = (2x-5)(x+1)(x-2)(x+3)(x-\sqrt{3})(x+\sqrt{3})$