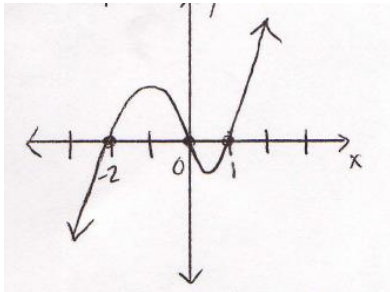
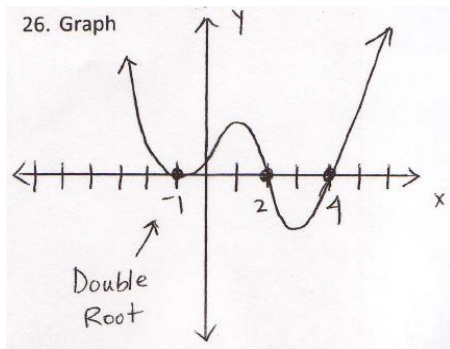


## MA1 Midyear Review Answers 2014-2015

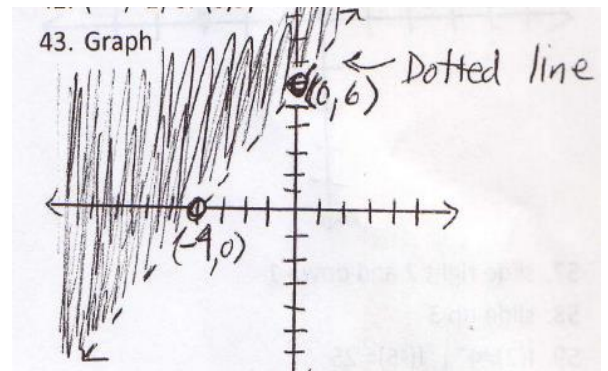
1.  $\frac{2}{3}$
2.  $-\frac{12}{5}$
3.  $y = -\frac{1}{2}x + 2$  OR  $x + 2y = 4$
4.  $y = 2x - 1$  OR  $2x - y = 1$
5.  $A = \frac{7}{2}$
6.  $A = 3$
7.  $(0, -3)$
8.  $(-3, -1)$  and  $(1, 7)$
9.  $(-1, -12)$
10.  $(5, -24)$
11.  $y = -2x + 5$  OR  $2x + y = 5$
12.  $y = 3x - 9$  OR  $3x - y = 9$
13. 1
14.  $i$
15.  $4i\sqrt{2}$
16.  $5i\sqrt{2}$
17.  $11 + 10i$
18.  $-4 + 19i$
19.  $x = 2$  and  $x = -5$
20.  $-1 \pm \sqrt{7}$
21.  $(2, -12)$
22.  $(\frac{3}{2}, -\frac{63}{4})$
23.  $(3, 0)$  and  $(5, 0)$
24.  $(-6, 0)$  and  $(2, 0)$
- 25.



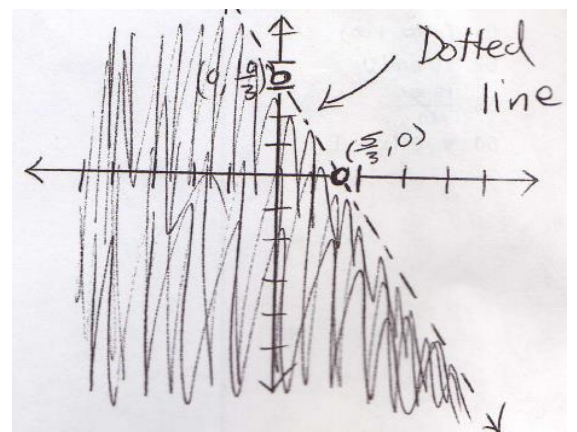
26.



27. 112
28. 62
29.  $y = x^3 + x^2 - 6x$
30.  $y = (x + 1)^2(x - 2)(x - 4) = x^4 - 4x^3 - 3x^2 + 10x + 8$
31. Each real root represents an x-intercept. Since imaginary (complex) roots must come in pairs, there must be an even number of them. Therefore every odd degree function must have at least one real root.
32. All irrational and imaginary (complex) roots come in pairs, in the forms  $a \pm \sqrt{b}$  or  $a \pm bi$ , respectively.
33. From 0 to 4
34. A double root.
35.  $k = -\frac{14}{3}$
36.  $k = 1$
37.  $(\frac{9}{4}, \infty)$   $x > \frac{9}{4}$
38.  $(-\infty, -\frac{7}{2}]$   $x \leq -\frac{7}{2}$
39.  $(-\frac{11}{2}, \frac{1}{2})$   $-\frac{11}{2} < x < \frac{1}{2}$
40.  $(-\infty, -6] \cup [14, \infty)$   $x \leq -6$  or  $x \geq 14$
41.  $(-2, 1) \cup (1, \infty)$   $-2 < x < 1$  or  $x > 1$
42.  $(-\infty, -2) \cup (3, 5)$   $x < -2$  or  $3 < x < 5$
- 43.

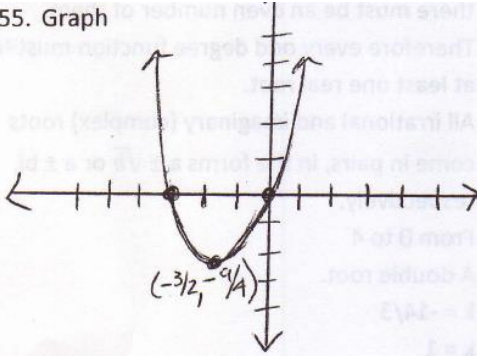


44.



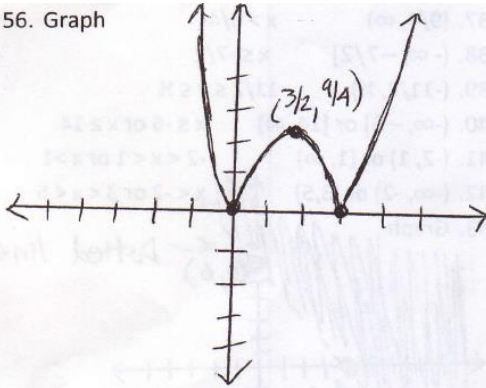
45. Domain:  $(-\infty, \infty)$       Range:  $[-3, \infty)$   
 46. Domain:  $[-10, \infty)$       Range:  $(-\infty, \infty)$   
 47.  $f^{-1}(x) = \frac{x+5}{4}$   
 48.  $f^{-1}(x) = \sqrt[3]{x-4}$   
 49. 0  
 50.  $x^2 + x - 5$   
 51. 28  
 52. 11  
 53.  $16x^2 - 52x + 40$   
 54.  $4x^2 - 12x - 5$   
 55.

55. Graph

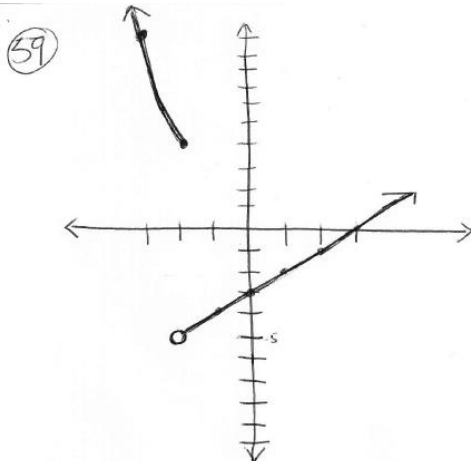


56.

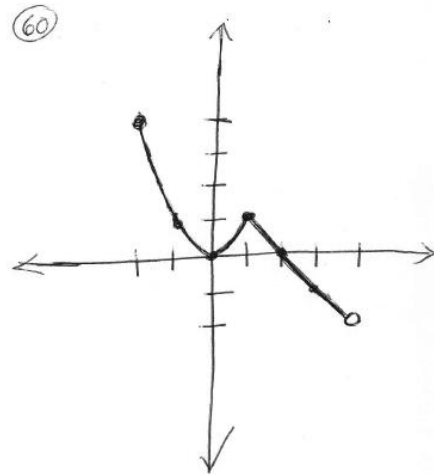
56. Graph



57. slide right 2 and down 1  
 58. slide up 3  
 59.  $f(2) = -1$        $f(-5) = 25$



60. D:  $[-2, 4)$       R:  $(-2, 4]$       Z:  $(0, 0)$   $(2, 0)$



61.  $(-\infty, -4) \cup (-4, \infty)$   
 62.  $(-\infty, \infty)$   
 63. 10 and 0  
 64.  $\frac{9-3i}{5}$   
 65.  $y < 3x - 1$   
 66. A function has an inverse if it is one-to-one, which means for every  $x$  there is only one  $y$  and for every  $y$  there is only one  $x$ . The graph must pass both the vertical line test and the horizontal line test.  
 67.  $f(\frac{1}{2}) = -3$ ,  $f(\pi) = 3$ , and  $f(-3.2) = -11$   
 68. The amplitude is half of the total height of a periodic functions found by  $A = \frac{\max y - \min y}{2}$

The fundamental period is the smallest distance on the  $x$ -axis that it takes for the function to repeat the same pattern.

69. a)  $\frac{27}{x^2}$       b)  $x^2 - 4xz$       c)  $\frac{3y}{4\sqrt{x}} - \frac{1xy^2}{2}$   
 70. a)  $2^x = 64$ ,  $x = 6$   
 b)  $x^5 = 32$ ,  $x = 2$   
 c)  $81^{1/2} = x$ ,  $x = 9$   
 d)  $e^x = e^3$ ,  $x = 3$   
 e)  $10^x = 1000$ ,  $x = 3$