ANSWERS

Max # of solutions  Min # of solutions

1a) 5 1  
1b) 4 0  
1c) 3 1  
1d) 6 0

2a) yes  
2b) no, \( \sqrt{-4} \) is an imaginary coefficient  
2c) yes  
2d) yes  
2e) no, power not a whole number

3a) \( x = 6 \), \( x = -3 \), \( x = 2 \)  
3b) \( x = 0 \), \( x = \frac{1}{5} \), \( x = \frac{3}{2} \)  
3c) \( x = 0 \), \( x = -1 \), \( x = 1 \)

4a) \( x = 2 \)  
4b) \( x = 1 \)  
4c) \( x = -5 \pm 2\sqrt{2} \) or \( x = -2.62 \), \( x = -7.38 \)

5a) \( x = 4 \)  
5b) \( x = 3 \), \( x = 1 \)

6a) \( x = 4 \), \( x = -1.5 \), \( x = \frac{1}{3} \)  
6b) \( x = -3 \), \( x = -2 \), \( x = 1 \)  
6c) \( x = 0 \), \( x = -1 \), \( x = 2 \), \( x = 3 \)  
6d) \( x = -1 \), \( x = 5 \), \( x = 2\sqrt{3} \)

7a) \( x = 2 \)  
7b) \( x = \frac{1}{2} \), \( x = \frac{3 \pm \sqrt{13}}{2} \)  
7c) \( x = -2 \), \( x = 2 \), \( x = \frac{3 \pm \sqrt{13}}{4} \)  
7d) \( x = 0 \), \( x = \pm \sqrt{3} \)

8a) \( y = x^3 - 3x^2 - 24x + 80 \)  
8b) \( y = x^4 - 5x^2 + 6 \)  
8c) \( y = 2(x^5 - 6x^4 + 26x^3 - 18x^2 - 27x + 27) \)

9) The dimensions of the box are:  
1cm by 6cm by 9cm or  
2cm by 4cm by 6cm

10a) \( F(x) = -(10-x)(x-5) \)  
10b) The carver would have to remove 2 cm off each dimension  
10c) Check solutions for graph

11a) \( F(x) = (6+x)(10+2x)(4-x) \)  
11b) Jon would have to remove 1.5 feet off the height, add 1.5 to the width, and add 3 feet to the length

12) \( 945 = (x+2)(x+4)(x+6) \)  
The integers would be 3, 5, 7 and 9 or -9, -7, -5, -3

13) \( 90 = \frac{(x-2)(2x+2)}{2} \)  
The height of the triangular prism would be 12 units