

Show all your work if you want to receive credit.

- (1) Solve the following by completing the square.

$$2x^2 - 6x + 1 = 0$$

- (2) Solve by any method

(a) $x^4 - 8x^2 + 12 = 0$

(b) $11.34x^2 - 156 = 0$

(c) $x + 5\sqrt{x} + 6 = 0$

(d) $\frac{1}{x+2} + \frac{24}{x+3} = 13$

- (3) Divide $\frac{2 + 3i}{5 - 7i}$

- (4) Use synthetic division to divide the following $\frac{x^5 - 32}{x - 2}$. Write your answer as a polynomial.

Use algebra to solve the following:

- (5) Tina bicycles 160 miles at the rate of r mph. The same trip would have taken 2 hours longer if she had decreased her speed by 4 mph. Find r .
- (6) A carnival at a county fair normally sells three thousand tickets at 25¢ each. For each 5¢ increase in price, management estimates that 80 fewer tickets will be sold. What increase in price will produce \$994 of revenue?
- (7) The height (in feet) of the water level in a reservoir over a one year period is modeled by the function $H(t) = 3.3(t - 9)^2 + 14$ where $t = 1$ represents January, $t = 2$ represents February, and so on. How low did the water get and in what month did the low water mark occur?