

Show all work (and answers) on the blank paper provided. Write only your name on this paper.

Name:

1	10	
2	10	
3	10	
4	10	
5	10	
6	10	
7	15	
8	15	
9a	10	
9b	10	
9c	10	
10a	10	
10b	10	
10c	10	
10d	10	
10e	10	
11	10	
12	10	
total	190	
curve		
%		

Some Handy Formulas:

$$A^3 - B^3 = (A - B)(A^2 + AB + B^2)$$

$$A^3 + B^3 = (A + B)(A^2 - AB + B^2)$$

1) Multiply and simplify: $\sqrt{-15} \cdot \sqrt{-5}$.

2) Simplify: i^{821} .

3) Find the quotient, writing the answer in standard form: $\frac{14 + 5i}{3 + 2i}$

4) Solve by factoring (i.e. use the zero-factor property): $5x^2 - 2 = 3x$

5) Solve by completing the square: $2x^2 - 4x = 3$

6) Solve the cubic equation (there will be three solutions in all): $x^3 - 8 = 0$

7) Adama and Tigh have received walkie-talkies for Winter Solstice. If they leave from the same point at the same time, Adama walking north at 5 km/h and Tigh walking west at 6 km/h, how long will they be able to talk to each other if the range of the walkie-talkies is 10 km? Round your answer to the nearest minute.

8) The volume of a 12-oz Frankenberry cereal box is 200 in^3 . The width of the box is 3.5 inches less than the length, and its depth is 2.8 inches. Find the dimensions of the box to the nearest hundredth.

9) Solve each equation.

a. $\sqrt{x} + 2 = \sqrt{4 + 7\sqrt{x}}$

b. $\frac{2x - 5}{x} = \frac{x - 2}{3}$

c. $x^4 + 2x^2 - 15 = 0$

10) Solve each inequality, writing each solution set in interval notation. No graph is necessary!

a. $6x - (2x + 3) \geq 4x - 5$

b. $x^2 - x < 6$

c. $(x - 5)(3x - 5)(x + 2) \geq 0$

d. $\frac{3}{x - 6} \leq 2$

e. $|5 - 3x| < 4$

11) Solve $|10 - 4x| + 1 = 5$.

12) Use the distance formula to determine whether the three points $(-4, 3)$, $(2, 5)$, $(-1, -6)$ are collinear.