

Name: _____

Circle your answer to problems 1-3. You must show correct work to receive credit.

(8 pts.) 1) $i(2 - 3i)^2 =$

- A. $12 - 5i$
- B. $13i$
- C. 5
- D. $12 + 13i$
- E. $13 + 5i$
- F. $5 + 12i$
- G. None of the above

(8 pts.) 2) Find the distance between $(2, 3)$ and $(-6, 1)$.

- A. $2\sqrt{5}$
- B. $2\sqrt{17}$
- C. $\sqrt{82}$
- D. $4\sqrt{2}$
- E. $\sqrt{6}$
- F. $4\sqrt{5}$

(8 pts.) 3) Solve $B = \frac{1}{3}k(1 + r^2)$ for r . Assume $r > 0$.

- A. $r = \sqrt{\frac{3B}{k} - 1}$
- B. $r = \sqrt{\frac{B}{k} - 1}$
- C. $r = \sqrt{3B - k - 1}$
- D. $r = \sqrt{B - \frac{1}{3}k - 1}$
- E. $r = \sqrt{\frac{B}{3k} + 1}$
- F. $r = \sqrt{\frac{3B}{k} - 3}$

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(18 pts.) 4) Solve for x . Simplify completely.

(10 pts.) a) $3x^2 + 6x + 4 = 0$

(8 pts.) b) $\sqrt{x+18} = 2 - x$

(8 pts.) 5. Solve the inequality and express your answer in interval notation.

$$|x - 2| \geq 4$$

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- (8 pts.) 6. Find a general form, $Ax + By = C$, (where A , B and C are integers), of the equation of the line through $(-4, 3)$ and perpendicular to the line $2x - 5y = 15$.

- (8 pts.) 7. Find the standard form of the equation of the circle with endpoints of a diameter at $(-3, -5)$ and $(-7, 9)$.

- (12 pts.) 8. Solve the inequality and express the solution in interval notation. You must use a sign chart (or equivalent) to support your answer.

$$x^3 - 4x^2 + 4x > 0$$

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- (10 pts.) 9. Bill's allowance in 1970 was \$49. In 2000, still living at home (how sad), his allowance was \$124. Assume his allowance is linearly related to time. Express his allowance, A (in dollars), in terms of time, t (in years), with $t = 0$ corresponding to the year 1970.

- (12 pts.) 10. Starting with a piece of cardboard whose length is 3 inches longer than twice its width, an open box (no top) is to be constructed by removing 2-inch squares from the corners and folding up the sides. What does the original width of the cardboard have to be in order to produce a box with a volume of 30 cubic inches? Label the picture, set up an equation, and solve.

