

Practice Midterm 2c

Name: _____

Short Answer (*4 pts. each, 20 pts. total*)

Write each of the following quantities in the form $a + bi$.

1. $6i(3 + 2i)$

2. $\frac{i}{2 - i}$

3. $i - (3 + 2i)$

4. $\left(\frac{1}{\sqrt{2}} - \frac{i}{\sqrt{2}}\right)^7$

5. $\frac{1}{3 - i}$

Proofs (5 pts. each, 10 pts. total)

Prove or disprove the following statements.

6. The relation \leq on \mathbb{N} is a partial order.
7. Fix a set X . The relation \subseteq on $\mathcal{P}(X) = \{Y \subseteq X\}$ is a partial order.

Web of dependencies (20 pts.)¹

8. Draw a web of dependencies exhibiting the interrelations among the definitions and results introduced in this course.
 - Each definition or result should be represented as a node, along with a brief description.
 - If two definitions or results are related directly, insofar as the relation is not mediated by another definition or result, then this relation should be depicted by an arrow between the two along with a brief description.

¹1 point per labeled node, 1 per description, $+\frac{1}{k}$ extra credit for the k th additional node or description