26. $\because c_1, c_2 \in P \therefore c_1 + c_2 \in P$ (2.1.5(i)), ~~or add~~

27. $a - c = a + (-c)$ (Defn. of subtraction)

28. $a - c = c_1 + c_2$ (Transitivity of eq on 27, 25)

29. By 26, $a - c \in P \therefore a \geq c$ (Defn. 2.1.6(a))

(b) 1. $a \geq b$ is Given. $\therefore$ By defn. 2.1.6(a), $a - b \in P$

2. $\because P$ is a non-empty, $\exists c_1 \in P$ s.t. $a - b = c_1$

~~(a-b)+0 = (a-b) (Reflexive prop of eq)~~ 3. $(a-b)+0 = (a-b)$ (A3)

4. $c + (-c) = 0$ (A4) 5. $(a-b)+(c+(-c)) = (a-b)+0$ (Substitution of eq on 4)

6. $(a-b)+(c+(-c)) = (a-b)$ (Transitivity of eq on 5, 3)

7. $((a-b)+c)+(-c) = (a-b)+(c+(-c))$ (A2)

8. $((a-b)+c)+(-c) = (a-b)$ (Transitivity of eq on 7, 6)

9. $c + (a-b) = (a-b) + c$ (A1) 10. ~~(a-b) = a+(-b)~~ $(a-b) = a + (-b)$ (Defn. of subtraction)

11. $a + (-b) = (a-b)$ (Symmetry of eq on 10) 12. $c + (a + (-b)) = c + (a-b)$ (Substitution of eq on 11)

13. $c + (a + (-b)) = (a-b) + c$ (Transitivity of eq on 12, 9)

14. $(c+a)+(-b) = c + (a + (-b))$ (A2) 15. $(c+a)+(-b) = (a-b)+c$ (Transitivity of eq on 14, 13)

16. $a + c = c + a$ (A1) 17. $(a+c)+(-b) = (c+a)+(-b)$ (Substitution of eq on 16)

18. $(a+c)+(-b) = (a-b)+c$ (Transitivity of eq on 17, 15)

19. $((a+c)+(-b))+(-c) = ((a-b)+c)+(-c)$ (Substitution of eq on 18)

20. $((a+c)+(-b))+(-c) = (a-b)$ (Transitivity of eq on 19, 8)

21. $((a+c)+(-b))+(-c) = (a+c)+((-b)+(-c))$ (A2)

22. $(a+c)+((-b)+(-c)) = ((a+c)+(-b))+(-c)$ (Symmetry of eq on 21)

23. $(a+c)+((-b)+(-c)) = (a-b)$ (Transitivity of eq on 22, 20)

~~24. (-b) = (-1)·b + (-c) (Defn. of subtraction)~~

~~24. (-b) = (-1)·(c)~~

24. $(-1)\cdot b = (-b)$ (Ex 2.1, 1(c)) 25. $(-1)\cdot b + (-c) = (-b) + (-c)$ (Substitution prop of eq on 24)

26. $(-1)\cdot c = (-c)$ (Ex 2.1, 1(c)) 27. $(-1)\cdot b + (-1)\cdot c = (-1)\cdot b + (-c)$ (Substitution prop of eq on 26)