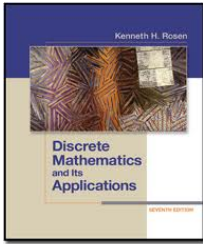


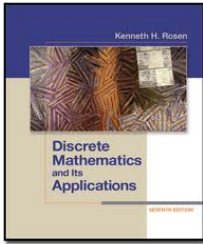
Peer Instruction #7: Math Review



Math Proofs: Contrapositive

Which is the correct contrapositive of the hypothesis $O(x) \wedge O(y) \rightarrow O(7xy)$?

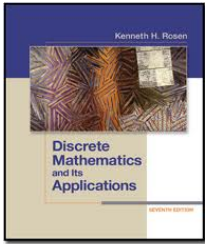
- A. $E(7xy) \rightarrow O(x) \wedge O(y)$
- B. $E(7xy) \rightarrow E(x) \vee E(y)$
- C. $E(x) \vee E(y) \rightarrow O(7xy)$
- D. None of the above



Math Proofs: Contradiction

Which is the correct contradiction of the hypothesis $O(x) \wedge O(y) \rightarrow O(7xy)$?

- A. $O(7xy) \wedge (E(x) \wedge E(y))$
- B. $(E(x) \vee E(y)) \wedge E(7xy)$
- C. $(O(x) \wedge O(y)) \wedge E(7xy)$
- D. None of the above



Pre and Post Conditions

// What is the postcondition for return value?

```
public static int foo(int x) {
```

```
    // Precondition:  $-3 < x \leq 4$ 
```

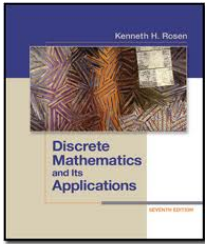
```
    return (x * x - 3 * x + 4);
```

```
}    A.  $0 \leq \text{return value} \leq 14$ 
```

```
    B.  $2 \leq \text{return value} \leq 22$ 
```

```
    C.  $2 \leq \text{return value} \leq 14$ 
```

```
    D. None of the above
```



Pre and Post Conditions

// What is the precondition for x?

```
public static int foo(int x) {  
    return (x * x + 3 * x - 8);
```

// Postcondition $-10 \leq \text{return} \leq 2$

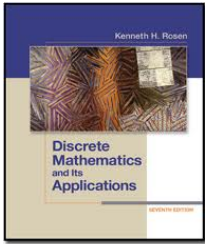
```
}
```

A. $-6 \leq x \leq 3$

B. $-6 \leq x \leq 2$

C. $-5 \leq x \leq 3$

D. None of the above



Loop Invariants

// What is the loop invariant for z?

```
int x = 2, y = 3, z = v1;
```

```
while (x <= 4) {
```

```
    z += y;
```

```
    x++;
```

```
}
```

A. $v1 \leq z \leq v1 * 3$

B. $v1 \leq z \leq v1 + 9$

C. $v1 \leq z \leq 12$;

D. None of the above