

Teaching Unit 2: Boolean Logic and Conditionals

2.1 Boolean Operators

Problems

Name: _____ Date: _____

Write your reasoning and Java code in the space below. Code uses java.util imports where needed.

2.1.1 - Trace

Determine the exact output. Explain the Java rule or state changes that produce it.

```
boolean a = true;  
boolean b = false;  
System.out.println(!a || b && a);
```

2.1.2 - Write code

For int x = 10, print whether x lies outside the inclusive interval 3 through 8. Use De Morgan's law to write the condition without !.

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2.2 If/Else Tracing

Problems

Name: _____ Date: _____

Write your reasoning and Java code in the space below. Code uses java.util imports where needed.

2.2.1 - Trace

Determine the exact output. Explain the Java rule or state changes that produce it.

```
int n = 6;  
if (n > 3) n -= 2;  
if (n > 3) n *= 2;  
System.out.println(n);
```

2.2.2 - Write code

Given int temperature = 0, print freezing for values at most 0, cool for values from 1 through 15, and warm otherwise.

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2.3 Compound Conditions

Problems

Name: _____ Date: _____

Write your reasoning and Java code in the space below. Code uses java.util imports where needed.

2.3.1 - Trace

Determine the exact output. Explain the Java rule or state changes that produce it.

```
int n = 5;  
System.out.println(n < 2 || n >= 5 && n < 8);
```

2.3.2 - Write code

Write public static boolean eligible(int age, boolean permission). Return true for adults age 18 or older, or for ages 14 through 17 with permission. Younger applicants are ineligible.

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2.4 Short-Circuit Logic

Problems

Name: _____ Date: _____

Write your reasoning and Java code in the space below. Code uses java.util imports where needed.

2.4.1 - Trace

Determine the exact output. Explain the Java rule or state changes that produce it.

```
int n = 0;  
System.out.println(n == 0 || 12 / n > 2);
```

2.4.2 - Write code

Write public static boolean startsWithA(String text), allowing null or empty input. Return true only if its first character, represented as a one-character substring, is "A".