

7/18/22 Methods: Trace Drawing - Loops

Group 2: Ashley, David, Kate, Yeidy

$\text{gcd}(39, 24)$

Variables:

$\begin{matrix} a \\ b \\ r \end{matrix} \left. \vphantom{\begin{matrix} a \\ b \\ r \end{matrix}} \right\} \text{all ints}$

```
public static int gcd(int a, int b) {
    int r = 0;
    while (a % b != 0) {
        r = a % b;
        a = b;
        b = r;
    } // mod check loop
    return b;
} // gcd

gcd(39, 24)
```

Loop #	a	b	r	Work it out
	39	24	0	(parameters, declaration & initialization of r)
1	24	15	15	$a \% b \neq 0$ TRUE $r = a \% b = 39 \% 24 = 15$ $a = b = 24$ $b = r = 15$
2	15	9	9	$a \% b \neq 0$ TRUE $r = a \% b = 24 \% 15 = 9$ $a = b = 15$ $b = r = 9$
3	9	6	6	$a \% b \neq 0$ TRUE $r = a \% b = 15 \% 9 = 6$ $a = b = 9$ $b = r = 6$
4	6	3	3	$a \% b \neq 0$ TRUE $r = a \% b = 9 \% 6 = 3$ $a = b = 6$ $b = r = 3$
5				$a \% b \neq 0$ FALSE \hookrightarrow return b \rightarrow return 3