Review 8-2

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1. Fill in the blanks in the table below.

$p[i]$: The price for a rod of length i.
$r[i]$: The maximum revenue for a rod of length i.
$s[i]$: The length of the leftmost piece when the revenue is maximum.

i	0	1	2	3	4	5	6	7	8	9	10
$p[i]$	0	1	5	8	9	10	17	17	20	24	30
$r[i]$	0	1	5	8	10	13	17	18	22	25	30
$s[i]$	0	1	2	3	2	2	6	1	2	3	10

2. Fill in the blanks in the following pseudocode for EXTENDED-BOTTOM-UP-CUT-ROD.

```
EXTENDED-BOTTOM-UP-CUT-ROD (p, n)
    let r[0 .. n] and s[0 .. n] be new arrays
    r[0] = 0
    for j = 1 to n
        r[j] = −∞
        for i = 1 to j
            if r[j] < p[i] + r[j−i]
                q = p[i] + r[j-i]
                s[j] = i
    return r and s
```

3. Fill in the blanks in the following pseudocode for PRINT-CUT-ROD-SOLUTION.

```
PRINT-CUT-ROD-SOLUTION (p, n)
    (r, s) = EXTENDED-BOTTOM-UP-CUT-ROD (p, n)
    while n > 0
        print s[n]
        n = n - s[n]
```

4. Fill in the blanks in the following pseudocode for M-CUT-ROD.

```
M-CUT-ROD (p, n)
    let r[0 .. n] be a new array
    for i = 0 to n
        r[i] = −∞
    return M-CUT-ROD-A (p, n, r)

M-CUT-ROD-A (p, n, r)
    if r[n] ≥ 0
        return r[n]
    if n == 0
        return 0
    else q = −∞
        for i = 1 to n
            q = max(q, p[i] + M-CUT-ROD-A(p, n − i, r))
    r[n] = q
    return q
```