| CS 173, Fa   |   | NE      | TID:    | ;    |                        |            |      |       |        |         |          |   |
|--|---|---------|---------|------|------------------------|------------|------|-------|--------|---------|----------|---|
| FIRST:   |   |         |         |      | $\mathbf{L}\mathbf{A}$ | ST:        |      |       |        |         |          |   |
| Discussion:  | Thursday                                | 2       | 3       | 4    | 5                      | Friday     | 9    | 10    | 11     | 12      | 1        | 2                                       |
| 1. (5 points) Let remainder $r$ of                                       | a and $b$ be integ $a$ divided by $b$ . |         |         |      |                        |            |      |       |        | quotier | nt $q$ a | $\operatorname{nd}  \operatorname{the}$ |
| 2. (6 points) Use  | the Euclidean a                         | lgorith | nm to o | com  | pute                   | gcd(7839,  | 1474 | . Sho | w youi | work.   |          |   |
| 3. (4 points) Chec   | k the (single) bo                       | ox tha  | t best  | chai | racte                  | rizes each | item |       |        |         |          |   |
| $-7 \equiv 13 \pmod{8}$  | 5) true                                 |         | fa      | ılse |                        |            |      |       |        |         |          |   |
| $\gcd(p,q) = \frac{1}{\text{lcm}}$ $(p \text{ and } q \text{ positive})$ | $\frac{pq}{(p,q)}$ we integers)         | al      | ways    |      |                        | sometime   | es [ |       | neve   | r       |          |   |

| FIRST:                               |                    |        |               |       | LA     | ST:                  |          |         |         |        |     |
|--------------------------------------|--------------------|--------|---------------|-------|--------|----------------------|----------|---------|---------|--------|-----|
| Discussion:                          | Thursday           | 2      | 3             | 4     | 5      | Friday 9             | 10       | 11      | 12      | 1      | 2   |
| 1. (5 points) Is the showing that it |                    | true   | ? Info        | ormal | lly ex | plain why it i       | s false, | or give | a concı | rete e | xam |
|                                      | n integer $n$ such | that   | $n \equiv 2$  | 2 (mo | od 6)  | and $n \equiv 1$ (1) | mod 9)?  | •       |         |        |     |
|                                      |                    |        |               |       |        |                      |          |         |         |        |     |
|                                      |                    |        |               |       |        |                      |          |         |         |        |     |
|                                      |                    |        |               |       |        |                      |          |         |         |        |     |
|                                      |                    |        |               |       |        |                      |          |         |         |        |     |
|                                      |                    |        |               |       |        |                      |          |         |         |        |     |
|                                      |                    |        |               |       |        |                      |          |         |         |        |     |
|                                      |                    |        |               |       |        |                      |          |         |         |        |     |
| 2. (6 points) Use                    | the Euclidean al   | lgorit | $^{ m hm}$ to | o com | ıpute  | $\gcd(1702, 12)$     | 21). Sh  | ow you  | r work. |        |     |
| 2. (6 points) Use                    | the Euclidean al   | lgorit | hm to         | o com | npute  | $\gcd(1702, 12)$     | 21). Sh  | ow you  | r work. |        |     |
| 2. (6 points) Use                    | the Euclidean al   | lgorit | hm to         | o com | npute  | $\gcd(1702, 12)$     | 21). Sh  | ow you  | r work. |        |     |
| 2. (6 points) Use                    | the Euclidean al   | lgorit | hm te         | o com | npute  | gcd(1702, 12         | 21). Sh  | ow you  | r work. |        |     |
| 2. (6 points) Use                    | the Euclidean al   | lgorit | hm to         | o con | npute  | gcd(1702, 12         | 21). Sh  | ow you  | r work. |        |     |
| 2. (6 points) Use                    | the Euclidean al   | lgorit | .hm to        | o con | npute  | gcd(1702, 12         | 21). Sh  | ow you  | r work. |        |     |
| 2. (6 points) Use 3. (4 points) Chec |                    |        |               |       |        |                      |          | ow you  | r work. |        |     |

| CS 173, Fa<br>Examlet 2               |                                     | NE      | ETII   | <b>)</b> : |              |                      |        |        |        |         |       |       |
|---------------------------------------|-------------------------------------|---------|--------|------------|--------------|----------------------|--------|--------|--------|---------|-------|-------|
| FIRST:                                |                                     |         |        |            | LA           | ST:                  |        |        |        |         |       |       |
| Discussion:                           | Thursday                            | 2       | 3      | 4          | 5            | Friday               | 9      | 10     | 11     | 12      | 1     | 2     |
| 1. (5 points) Is t<br>example showing | the following clang that it is not. | im tr   | ue? l  | Inforn     | nally        | explain wh           | y it   | is, or | give a | a concr | ete c | ounte |
| _                                     | or all non-zero in                  | tegers  | a an   | nd $b$ , i | $f a \mid a$ | $b$ and $b \mid a$ , | then   | a = 0  | b.     |         |       |       |
|                                       |                                     |         |        |            |              |                      |        |        |        |         |       |       |
|                                       |                                     |         |        |            |              |                      |        |        |        |         |       |       |
|                                       |                                     |         |        |            |              |                      |        |        |        |         |       |       |
|                                       |                                     |         |        |            |              |                      |        |        |        |         |       |       |
|                                       |                                     |         |        |            |              |                      |        |        |        |         |       |       |
| 2. (6 points) Use                     | the Euclidean a                     | lgorit  | hm to  | o con      | npute        | $\gcd(221,12)$       | 224).  | Show   | your   | work.   |       |       |
|                                       |                                     |         |        |            |              |                      |        |        |        |         |       |       |
|                                       |                                     |         |        |            |              |                      |        |        |        |         |       |       |
|                                       |                                     |         |        |            |              |                      |        |        |        |         |       |       |
|                                       |                                     |         |        |            |              |                      |        |        |        |         |       |       |
|                                       |                                     |         |        |            |              |                      |        |        |        |         |       |       |
| 3. (4 points) Chec                    | ck the (single) be                  | ox tha  | at bes | st cha     | racte        | rizes each i         | tem.   |        |        |         |       |       |
| For any positiv                       | $\mathbf{r}$ e integers $p$ and     | q,      |        |            |              |                      | $\neg$ | c 1    |        | 7       |       |       |
| if lcm(p,q) = per                     | q, then $p$ and $q$ ar              | re rela | tively | y prin     | ne.          | true                 |        | fals   | se     | j       |       |       |
|                                       |                                     |         |        |            |              |                      |        |        |        |         |       |       |
| $-7 \mid 0$                           | true                                | fa      | alse   |            |              |                      |        |        |        |         |       |       |

| FIRST:                               |                                    |        |              |       | LA    | ST:            |         |          |         |         |        |     |
|--------------------------------------|------------------------------------|--------|--------------|-------|-------|----------------|---------|----------|---------|---------|--------|-----|
| Discussion:                          | Thursday                           | 2      | 3            | 4     | 5     | Frida          | y 9     | 10       | 11      | 12      | 1      | 2   |
| 1. (5 points) Is the showing that it |                                    | ı true | e? Info      | ormal | ly ex | plain why      | y it is | false, o | or give | a conci | rete e | xam |
|                                      | n integer $n$ such                 | that   | $n \equiv 2$ | 2 (mc | od 6) | and $n \equiv$ | 5 (m    | od 15)   | ?       |         |        |     |
|                                      |                                    |        |              |       |       |                |         |          |         |         |        |     |
|                                      |                                    |        |              |       |       |                |         |          |         |         |        |     |
|                                      |                                    |        |              |       |       |                |         |          |         |         |        |     |
|                                      |                                    |        |              |       |       |                |         |          |         |         |        |     |
|                                      |                                    |        |              |       |       |                |         |          |         |         |        |     |
|                                      |                                    |        |              |       |       |                |         |          |         |         |        |     |
| 2. (6 points) Use                    | the Euclidean a                    | lgorit | thm to       | o com | npute | $\gcd(221)$    | , 1224  | ). Show  | v your  | work.   |        |     |
| 2. (6 points) Use                    | the Euclidean al                   | lgorit | chm to       | o com | npute | gcd(221        | , 1224  | ). Show  | v your  | work.   |        |     |
| 2. (6 points) Use                    | the Euclidean al                   | lgorit | chm to       | o com | ıpute | gcd(221,       | , 1224  | ). Shov  | v your  | work.   |        |     |
| 2. (6 points) Use                    | the Euclidean al                   | lgorit | thm to       | o com | ıpute | gcd(221,       | , 1224  | ). Show  | v your  | work.   |        |     |
| 2. (6 points) Use                    | the Euclidean al                   | lgorit | hm to        | o com | ipute | gcd(221        | , 1224  | ). Shov  | v your  | work.   |        |     |
| 2. (6 points) Use                    | the Euclidean a                    | lgorit | chm to       | o com | ıpute | gcd(221        | , 1224  | ). Show  | v your  | work.   |        |     |
| 2. (6 points) Use 3. (4 points) Chec |                                    |        |              |       |       |                |         |          | v your  | work.   |        |     |
|                                      | ck the (single) be<br>positive and |        |              |       |       |                |         |          | v your  | work.   |        |     |

| CS 173, Fa<br>Examlet 2,                                       |                      | NE                      | ETII                    | D:          |                               |                   |        |          |         |         |        |      |
|--|----------------------|-------------------------|-------------------------|-------------|-------------------------------|-------------------|--------|----------|---------|---------|--------|------|
| FIRST:   |                      |                         |                         |             | LA                            | ST:               |        |          |         |         |        |      |
| Discussion:  | Thursday             | 2                       | 3                       | 4           | 5                             | Frida             | y 9    | 10       | 11      | 12      | 1      | 2    |
| 1. (5 points) Is the showing that it                           |                      | n true                  | ? Inf                   | orma        | lly ex                        | plain why         | it is  | false, o | or give | a conci | rete e | xamp |
|  | ositive integers $a$ | <i>a</i> , <i>b</i> , a | $\operatorname{nd} c$ , | if $a \mid$ | c and                         | $d b \mid c$ , th | en ab  | c        |         |         |        |      |
|  |                      |                         |                         |             |                               |                   |        |          |         |         |        |      |
|  |                      |                         |                         |             |                               |                   |        |          |         |         |        |      |
| 2. (6 points) Use  | the Euclidean a      | lgorit                  | hm t                    | o con       | npute                         | $\gcd(535,$       | 1819   | ). Show  | v your  | work.   |        |      |
|  |                      |                         |                         |             |                               |                   |        |          |         |         |        |      |
|  |                      |                         |                         |             |                               |                   |        |          |         |         |        |      |
|  |                      |                         |                         |             |                               |                   |        |          |         |         |        |      |
| 3. (4 points) Chec   | ck the (single) be   | ox tha                  | at bes                  | st cha      | $\operatorname{ract}\epsilon$ | erizes each       | ı item | 1.       |         |         |        |      |
| If $a$ and $b$ are properties $r = \text{remainder}(b, r) = 0$ | (a,b),               |                         |                         | 1           | true                          |                   | fal    | se       |         |         |        |      |
| $-7 \equiv 13 \pmod{8}$  | 5) true              |                         |                         | false       |                               | ]                 |        |          |         |         |        |      |

| CS 173, Fa<br>Examlet 2                     |                                      | NE     | ETII   | <b>)</b> : |         |                             |        |          |                          |         |        |       |
|---|--------------------------------------|--------|--------|------------|---------|-----------------------------|--------|----------|--------------------------|---------|--------|-------|
| FIRST:                                      |                                      |        |        |            | LA      | ST:                         |        |          |                          |         |        |       |
| Discussion:                                 | Thursday                             | 2      | 3      | 4          | 5       | Friday                      | 9      | 10       | 11                       | 12      | 1      | 2     |
| . (5 points) Is t                           | the following claing that it is not. | im tr  | ue? l  | Inforn     | nally   | explain w                   | hy i   | t is, or | give a                   | a conci | cete c | ounte |
| Claim: Fo $gcd(a, c) >$                     | or all positive inte > 1.            | egers  | a, b,  | and o      | c, if g | $\operatorname{cd}(a,bc) >$ | · 1, t | then go  | $\operatorname{ed}(a,b)$ | > 1 as  | nd     |       |
| . (6 points) Use                            | the Euclidean a                      | lgorit | thm t  | o con      | npute   | $\gcd(2385,$                | 636)   | ). Show  | w your                   | work.   |        |       |
|   |                                      |        |        |            |         |                             |        |          |                          |         |        |       |
| 6. (4 points) Chec                          | ck the (single) bo                   | ox the | at bes | st cha     | aracte  | rizes each                  | item   | 1.       |                          |         |        |       |
| If $p$ , $q$ , and $k$ a integers, then $g$ | _                                    | q      |        | pq         | !       | $\bigg] \qquad pqk$         |        |          | $q \gcd(p$               | (p,k)   |        |       |
| 0   7                                       | true                                 |        | false  |            | Ţ       |                             |        |          |                          |         |        |       |