Asynchronous lesson 0.1

2) 1. D

2. B

3. A

4. $255 = 2\times10^2 = 200$
$+ 5\times10^1 \quad +50$
$5\times10^0 \quad +5$

1000

3) 1. $1000 = 1$
$1001 = 9$
$1101 = 11$
$1111 = 15$

$1\times 2^0 = 1$
$0\times 2^1 = 0 \quad = 1$
$0\times 2^2 = 0$
$0\times 2^3 = 0$

$\underline{1001}$ $1\times 2^0 = 1$
$= 9$ $0\times 2^1 = 0$
$0\times 2^2 = 0$
$1\times 2^3 = 8$

$\underline{1101}$ $1\times 2^0 = 1$
$= 11$ $1\times 2^1 = 2$
$0\times 2^2 = 0$
$1\times 2^3 = 8$

$\underline{1111}$ 1×2^0
$= 15$ 1×2^1
1×2^2
1×2^3
$8+7$

2. $32 = 100,000$
$42 = 101010$
$11 = 1011$
$17 = 10001$

$32 \div 2$
$16 \div 2$
$8 \div 2$
$4 \div 2$
$2 \div 2$
$= 1$
$= 100,000$

$42 \div 2$
$21 \div 2$
$10 \div 2$
$= 5 \div 2$
$2 \div 2$
$= 101010$

$11 \div 2$
$= 5 \div 2$
$2 : 5 \div 2$
$= 1$
$= 1011$

$17 \div 2$
$8 \div 2$
$4 \div 2$
$2 \div 2$
$= 1$
$= 10001$

4. 1. B

2. 255 → hexadecimal, base 16

       | | | | remainder |
    a.) $255/16 = 15.9$ | | | 15

    b.) $15/16 = 0$ | | | 15

          $= FF_{16}$

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5. 1. a.) $20^0 = 1$
        $20^1 = 20$
        $20^2 = 400$

    b.) 400 — base 20
         $= 100$

    c.) 401 ? $= 101$

2. 25 $= 15$ -20 $= -5$
    45    $= 25$ -20 $= 5$
    425   $= 15$ -20 $= 95$
    625   $= 1B5$ -20 $= ?$

                              remainder?
    $25 \div 20 = 1.25$ no
    $45 \div 20 = 2.25$ no
    $425 \div 20 = 21.25$ yes
    $625 \div 20 = 31.25$ yes

3.
$1 = -5 = -$ ▬▬
$2 = 5$ ▬

3 - ⊖ ∘ ∘ ⊘