

Notes on turning in homework:

- You will turn in an *electronic copy* through **Brightspace**.
- Answer on a *separate* sheet of paper (if hand-writing the answers) or in a *separate* document (if typing the answers). Homework assignments do not have any room for answers in their layout.
- Your answers should be *self-documenting*, letting you *study* them without needing the assignment in hand. When answering a question: begin by copying the number and the question before writing your answer.

1. Multiply out the following polynomials: 2. Factor the following polynomials:

(a) $(n + 2)^2$

(a) $8x^3 + 12x^2 + 6x + 1$

(b) $(3x + 1)^2$

(b) $d^2 - 9$

(c) $(a + b)(a - b)$

(c) $n^3 - n$

(d) $(y + z)^3$

3. Given each of the following *recursive* function definitions, what are the values for n between 1 and 7 (seven answers for each part)?

(a) $H(n) = n \times H(n - 1); H(1) = 1$

(b) $Q(n) = 2 \times Q(n - 1); Q(1) = 2$

(c) $T(n) = T(n - 1) + T(n - 2) + T(n - 3); T(1) = 1, T(2) = 2, T(3) = 3$

4. Consider driving from Potsdam to Syracuse, a road distance of 144 *miles*. If you travel in 2 *hours*, 32 *minutes*.

(a) What *unit* would you use to express your traveling *speed*?

(b) What is the actual *speed* in the given example? Do not forget the units.

5. Consider an old, large wine barrel that is marked as holding 12 *hogsheads* of liquid. If, after opening the spigot on the *full* barrel, it takes 1 *minute* to empty.

(a) What *unit* would you use to express the rate of flow?

(b) What is the actual rate of flow in the example?

6. Consider transferring a 1 *megabyte* file across a network in 6 *seconds*.

bandwidth ::= speed of *data* across a network.

(a) What *unit* would you use to express *bandwidth*?

(b) What is the network *bandwidth* in the given example?

Submit your answers electronically, in a commonly readable format (e.g. .pdf, .txt, .docx), through BrightSpace. If you photograph hand-written answers please make sure there is enough contrast that I can read them and *please* put all the pages in a single file (Adobe Scan is available on Android and iOS).