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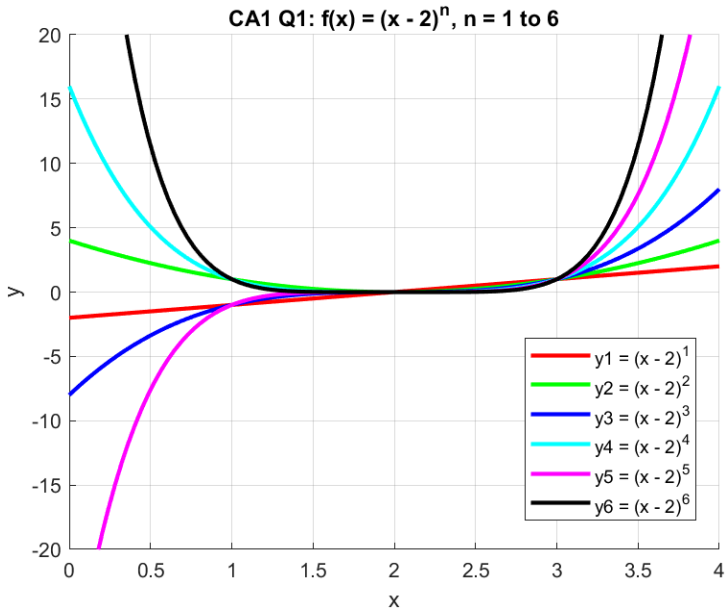
1.



2. Some testing results and additional comments:

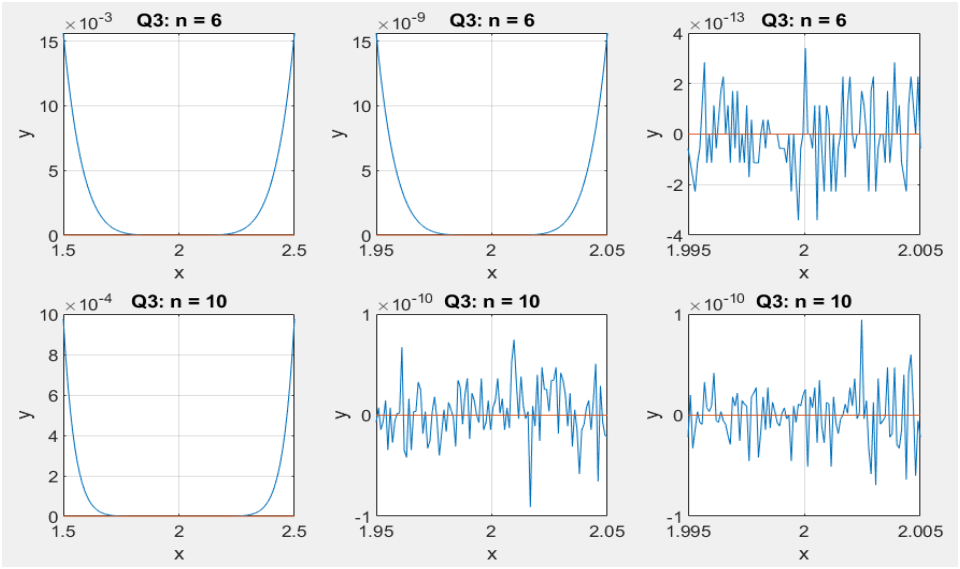
```
>> result = fexpand(2,6,8);
>> disp(result);
       46656

>> result = fexpand(2,3,4);
>> disp(result);
     8
```

Note that n must be >= 0:

```
>> result = fexpand(2,-3,4);
>> disp(result);
     0
```

3.



I chose n = 6 and n = 10 because they show the relation between error vs. n and delta.

Observations:

For the same n value, an error starts to appear as the delta value gets smaller.

As n increases, the error starts to appear at a higher delta value.

a) At n = 6 and delta = 0.01, 0.005. See 3rd plot(delta = 0.005) in Q3, and black colored plot(y6) in Q1.
b) As n increases, the number of graphs differs significantly from the “exact” plots also increases. Using the 6 delta values given in the instruction: at n = 6, 2 plots differ significantly. At n = 8, 4 plots differ significantly. At n = 18, all plots differ significantly.
c) Subtraction Cancellation error causes the errors we observe above. Subtraction cancellation error happens when we perform addition and subtraction. These operations round the numbers, therefore information is lost and the accuracy decreases.
When n increases, the number of terms in the expanded form increases, and each additional term performs an addition or subtraction. When the delta decreases, the accuracy given is higher. After performing an addition or subtraction, more information is lost. Therefore, both increasing of n and decreasing of delta raise more errors we can observe.