

Didi you can learn these things if you want 😊

Important Calculator Tricks for CA Foundation Students

- **General Advice:**

- Use a calculator like the ones recommended for CA exams.
- Most tricks work on 90% of calculators; some may require slight adjustments.
- Focus on learning a limited number of useful tricks (around 12) rather than memorising many.
- Understanding the logic behind the tricks is crucial for modifying them or creating your own.
- Always ensure your calculator memory is clear before starting calculations involving memory functions.

- **1. Entering Negative Numbers:**

- **How to:** Enter the number, then press the **+/-** button.
- **Example:** To enter -12, press **12**, then press the **+/-** button. Pressing it again will remove the negative sign.

- **2. Calculating Positive Powers (x^n):**

- **How to:** Enter the base number, press **Multiply (x)**, then press **Equals (=)** repeatedly.
- **Important:** The step count on the calculator (if available) will be **n + 1** when the power 'n' is reached. Ensure the calculator is cleared before starting.
- **Example:** To calculate 3^7 :
 1. Clear calculator.
 2. Press **3**.
 3. Press **x**.
 4. Press **=** repeatedly until the step count reaches 8 (for power 7). The display shows 2187.

- **3. Calculating Reciprocals ($1/x$):**

- **How to:** Enter the number you want the reciprocal of, press **Divide (÷)**, then press **Equals (=)**.
- **Example 1:** To calculate $1/81$:
 1. Press **81**.
 2. Press **÷**.
 3. Press **=**. The display shows 0.01234....
- **Example 2:** To calculate $1/3^7$:
 1. First calculate 3^7 using the power trick (result: 2187).
 2. With 2187 on the screen, press **÷**.

3. Press $=$. This calculates the reciprocal of 2187.

- **4. Calculating Negative Powers (x^{-n} which is $1/x^n$):**

- **How to:** Calculate the positive power (x^n), then take the reciprocal of the result.
- **Example:** To calculate 3^{-4} (equivalent to $1/3^4$):
 1. Calculate 3^4 : Press **3**, press **x**, press $=$ repeatedly until step count is 5 (for power 4). Result: 81.
 2. With 81 on the screen, take the reciprocal: Press $\div$, press $=$. This gives $1/81$, which is 3^{-4} .

- **5. Calculating Nth Roots ($x^{(1/n)}$):**

- **How to:** Enter the number, press the **Root ($\sqrt{}$)** button 12 times, subtract 1, divide by the root number (n), add 1, then press **Multiply (x)** and **Equals (=)** 12 times.
- **Example:** To calculate the cube root of 27 ($27^{(1/3)}$):
 1. Press **27**.
 2. Press $\sqrt{}$ 12 times.
 3. Press $-$, press **1**.
 4. Press $\div$, press **3** (for cube root).
 5. Press $+$, press **1**.
 6. Press **x**, press $=$ 12 times. The display shows approximately 3.
- **Note:** The source recommends this trick for roots where the answer is a smaller number as it minimises approximation errors. It is discouraged for "absurd powers" resulting in very large numbers.

- **6. Calculating Logarithm ($\log(x)$):**

- **How to:** Enter the number, press the **Root ($\sqrt{}$)** button 15 times, subtract 1, then multiply by 14230.
- **Note:** This trick is especially useful for solving equations involving powers where the exponent is unknown. The constant 14230 provides more accurate results for larger numbers.
- **Example:** To calculate $\log(2)$:
 1. Press **2**.
 2. Press $\sqrt{}$ 15 times.
 3. Press $-$, press **1**.
 4. Press **x**, press **14230**. The display shows approximately 3010 (representing 0.3010, as only digits after decimal and a few before are relevant).
- **Application Example:** Solving $0.3 = 0.9^x$. Take log on both sides: $\log(0.3) = x * \log(0.9)$. Then $x = \log(0.3) / \log(0.9)$. Calculate $\log(0.3)$ and $\log(0.9)$ using the trick, then divide. Note: Handling negative signs and using the reciprocal trick for division can simplify this.

- **7. Calculating Antilogarithm ($\text{Antilog}(x)$):**

- **How to:** This is the reverse procedure of calculating log. Enter the number, divide by 14230, add 1, then press **Multiply (x)** and **Equals (=)** 15 times.
 - **Example:** To calculate Antilog(0.301):
 1. Press **0.301**.
 2. Press $\div$, press **14230**.
 3. Press **+**, press **1**.
 4. Press **x**, press **=** 15 times. The display shows approximately 1.99..., which is approximately 2.
 - **Application Example:** If $\log(x) = 2.7$, find x . $x = \text{Antilog}(2.7)$.
 1. Press **2.7**.
 2. Press $\div$, press **14230**.
 3. Press **+**, press **1**.
 4. Press **x**, press **=** 15 times. The display shows approximately 501.1....
- **8. Calculating Absurd Powers (A^N) using Log & Antilog:**
 - **How to:** This method provides better accuracy for large or decimal powers compared to the root trick.
 1. Find the log of the base number ($\log A$).
 2. Multiply the result from step 1 by the power (N).
 3. Calculate the antilog of the result from step 2.
 - **Procedure:** $\text{Antilog}(\log(A) * N)$.
 - **Example:** To calculate $8^{7.2}$:
 1. Calculate $\log(8)$ using the log trick.
 2. Multiply the result ($\log(8)$) by 7.2.
 3. Calculate the antilog of the result from step 2 using the antilog trick. The final answer is very large (e.g., 3,330,000...).
- **9. Calculating Compound Interest:**
 - **Method 1 (Percentage Method - good for small 'n'):**
 - **How to (Accumulated Amount):** Enter Principal, press **+**, enter Interest Rate (as percentage), press **%**. Then press **+**, **%** again for the next period, and so on.
 - **How to (Interest Amount):** Calculate the Accumulated Amount, then subtract the Principal.
 - **Example:** 500 at 10% compound interest for 3 years:
 1. Press **500**.
 2. Press **+**, press **10**, press **%**.
 3. Press **+**, press **10**, press **%**.
 4. Press **+**, press **10**, press **%**. This gives the Accumulated Amount.
 5. Press **-**, press **500**. The display shows 165.5 (the interest).
 - **Method 2 (Formula Method using Calculator - good for larger 'n'):**
 - **Formula:** $\text{Interest} = \text{Principal} * [(1 + i)^n - 1]$, $\text{Accumulated Amount} = \text{Principal} * (1 + i)^n$, where i is rate as a decimal and n is number of periods.
 - **How to (Interest Amount using $(1+i)^n - 1$):**

1. Calculate $(1+i)^n$ using the power trick. (e.g., 1.1^3).

2. Subtract 1 from the result.

3. Multiply the result from step 2 by the Principal.

▪ **Example:** 500 at 10% compound interest for 3 years:

1. Calculate 1.1^3 : Press **1.1**, press **x**, press **=** until step 4. Result: 1.331.

2. Press **-**, press **1**. Result: 0.331.

3. Press **x**, press **500**. Result: 165.5 (the interest).

- **10. Using M+, M-, MR/MC (Memory Buttons):**

- **Purpose:** Store and recall values in memory, useful for summing or subtracting results of multiple calculations.

- **Buttons:**

- **M+**: Adds the current display value to the memory.

- **M-**: Subtracts the current display value from the memory.

- **MR/MC**: Often a single button. Press once for Memory Recall (MR) to display the current total in memory. Press twice for Memory Clear (MC) to clear the memory. Some calculators have separate MR and MC buttons.

- **Before Starting:** Always clear memory (press MR/MC twice). A small 'M' on the display indicates memory contains a value; it disappears when memory is cleared.

- **Example 1 (Sum of Products):** Calculate $(65) + (53) + (45) + (83)$.

- 1. Clear memory (MR/MC twice).

- 2. Calculate 6×5 . Press **M+**.

- 3. Calculate 5×3 . Press **M+**.

- 4. Calculate 4×5 . Press **M+**.

- 5. Calculate 8×3 . Press **M+**.

- 6. Press **MR/MC** once. The display shows 89.

- **Example 2 (Mixed Addition/Subtraction):** Calculate $(65) + (53) - (45) + (83)$.

- 1. Clear memory (MR/MC twice).

- 2. Calculate 6×5 . Press **M+**.

- 3. Calculate 5×3 . Press **M+**.

- 4. Calculate 4×5 . Press **M-**.

- 5. Calculate 8×3 . Press **M+**.

- 6. Press **MR/MC** once. The display shows 49 ($65=30$, $53=15$, $45=20$, $83=24$; $30+15-20+24 = 49$). The source example shows the result as 1 which seems incorrect based on the numbers; the procedure shown is correct.

Self-correction: The source shows the result as 1, but the calculation ($30+15-20+24$) equals 49. I will state the source's example result but note the discrepancy.

- 7. Press **MR/MC** once. The display shows 1 in the source example. (Note: based on the arithmetic, the result should be 49. The source's example might have a different set of numbers or a calculator specific behaviour).

- **11. Using GT (Grand Total):**

- **Purpose:** Sums all values that appeared on the display immediately after pressing the **Equals (=)** button. Useful when all terms to be added are positive.
- **How to:**
 1. Clear the calculator (All Clear or similar). Ensure memory is also clear.
 2. Perform the first calculation step, press **=**.
 3. Perform the second calculation step, press **=**.
 4. Repeat for all steps you want to sum.
 5. Press the **GT** button.
- **Important:** Press **=** only at the end of each individual calculation step that you want included in the total.
- **Example:** Calculate $(65) + (53) + (45) + (83)$.
 1. Clear calculator (All Clear).
 2. Press **6**, press **x**, press **5**, press **=**.
 3. Press **5**, press **x**, press **3**, press **=**.
 4. Press **4**, press **x**, press **5**, press **=**.
 5. Press **8**, press **x**, press **3**, press **=**.
 6. Press **GT**. The display shows 89 ($30 + 15 + 20 + 24$).

• **12. Solving Complex Equations (e.g., Annuity) using Memory Buttons:**

- **Purpose:** Breaks down complex formulas into manageable steps using memory (M+, MR) to store intermediate results, especially for values in the denominator. Allows solving without writing down intermediate numbers.
- **General Approach:**
 1. Identify parts of the equation to calculate and store in memory (often denominators or terms that appear multiple times).
 2. Clear memory (MR/MC twice).
 3. Calculate the value(s) to be stored and press **M+** to save them.
 4. Continue the rest of the calculation, using **MR** to recall the stored value when needed (e.g., for division).
- **Example (Present Value Annuity Calculation):** Calculate $2000 / [(1 - (1.1)^{-5}) / 0.1]$ which is a simplified form of an annuity calculation where 2000 is the annuity payment.
 1. The denominator involves $(1.1)^{-5}$, which is $1/(1.1)^5$. Calculate $(1.1)^5$ first: **1.1**, press **x**, press **=** until step 6.
 2. The result on the screen is $(1.1)^5$. Take its reciprocal: press **÷**, press **=**. This is now $(1.1)^{-5}$.
 3. From this result, subtract 1: press **-**, press **1**. (Wait, the formula is $1 - (1.1)^{-5}$... The source calculates $(1.1)^{-5} - 1$ first and then handles the negative sign later or uses M-? Let's follow the source steps precisely).
Correction based on source procedure: The source calculates $(1.1)^5$, stores it in memory, then uses it for division.
Revised Example Steps following source:
 4. Clear memory (MR/MC twice).

5. Calculate $(1.1)^5$: Press **1.1**, press **x**, press **=** until step 6. The result is approximately 1.6105.
6. Store this value in memory: Press **M+**. (This value represents $(1+i)^n$).
7. Now calculate the numerator of the denominator's fraction: $1 - (1.1)^{-5}$. Start with 1.
8. Press **1**, press **-**, press the value of $(1.1)^{-5}$. How to get $(1.1)^{-5}$? It's the reciprocal of the value stored in memory $((1.1)^5)$. Recall the memory value (MR), then take its reciprocal ($\div$, $=$).
- Let's retry following the logic from the source's slightly confusing explanation:*
9. Calculate $(1+i)^n$, e.g., 1.1^5 : **1.1**, **x**, **=** (until step 6). The value ~ 1.6105 is on screen.
10. Store this value in memory: Press **M+**.
11. Now calculate the term $(1 - (1+i)^{-n})$. This can be done by first calculating $(1+i)^{-n}$ (reciprocal of memory value) and subtracting it from 1. Or, calculate 1 divided by the memory value, then subtract from 1. Let's try the source's flow.
12. With ~ 1.6105 on screen (from step 1), press **-**, press **1**. (This step seems incorrect for the formula $1 - (1.1)^{-5}$).
13. Press $\div$, press **0.1**.
14. Press $\div$, press **MR** (recalls the original 1.1^5).
15. Press **=**. This sequence aims to calculate $((1.1)^5 - 1) / (0.1 * (1.1)^5)$.
- This is the formula for the denominator of the Future Value Annuity Factor, not Present Value.*

Re-interpreting source steps for PV Annuity Factor: PV Factor = $[1 - (1+i)^{-n}] / i$.

The source calculates $[(1+i)^n - 1] / [i * (1+i)^n]$ which is FV Factor. The source says it's calculating PV. Let's assume the example formula image is correct for PV. Denominator is $(1 - (1+i)^{-n}) / i$.

1. Calculate $(1+i)^n$, e.g., 1.1^5 : **1.1**, **x**, **=** (until step 6). Result ~ 1.6105 .
2. Store this in Memory: **M+**. (This is $(1+i)^n$).
3. Calculate $(1+i)^{-n}$. This is 1 divided by the value in memory. Press **1**, press $\div$, press **MR**, press **=**. (~ 0.6209)
4. Calculate $1 - (1+i)^{-n}$. Press **1**, press **-**, press the result from step 3, press **=**. (~ 0.3790)
5. Divide by i : Press $\div$, press **0.1**, press **=**. (~ 3.7908). This is the PV Annuity Factor.
6. Multiply by Annuity Payment: Press **x**, press **2000**, press **=**. (~ 7581.57).

Alternative Method from Source's later explanation for Annuity Payment (A) where PV is given. $A = PV / \text{PV Factor}$. PV Factor = $[1 - (1+i)^{-n}] / i$.

1. Calculate $(1+i)^n$, e.g., 1.1^5 : **1.1**, **x**, **=** (until step 6). Result ~ 1.6105 .
2. Store this in Memory: **M+**. (Value is 1.6105). *Source clears memory first then stores:* Clear memory (MR/MC twice), then with 1.6105 on screen, press **M+**.
3. Calculate $(1+i)^{-n}$: Press **1**, press $\div$, press **MR**, press **=**. (~ 0.6209)
4. Calculate $1 - (1+i)^{-n}$: Press **1**, press **-**, press the result from step 3, press **=**. (~ 0.3790)

5. Divide by i: Press $\div$, press **0.1**, press **=**. (~3.7908). This is the PV Factor.
6. Store the PV Factor in Memory (clearing previous content first). Clear memory (MR/MC twice). With ~3.7908 on screen, press **M+**.
7. Now calculate $A = PV / PV \text{ Factor}$. PV is 2000. Recall PV Factor from memory. Press **2000**, press $\div$, press **MR**, press **=**. The display shows the Annuity Payment (~527.6).