

External Triangle (Universal Windows Platform application)

Operation manual Ver. 1.1 (2020/ 3/10)

At the beginning: This application's characteristics are: number change by "direct touch to number" and automatic calculation of result. No explanation is necessary for basic calculations, I think. This manual includes only the minimum functional description. Word "Touch" in this manual is assuming touchscreen. If you use different point device like mouse, please replace it with the corresponding operation.

Attention: Please check by yourself carefully any value, if you use it to practical purpose.

I make no warranty and can't respond to claims of any kind of damage.

I have developed and checked this application with Surface Pro, its keyboard, and attached mouse. I follow rule of Universal Windows Platform, and I have corresponded and checked different screen resolution, so I believe it works on any models without a problem, but I can't guarantee. If you encounter this application's trouble, I wish you to inform me it with as much as possible detailed information like equipment specs, etc.

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Attached calculations in this Application

This application is specialized to triangle calculation. It has 5 sheets.

By scrolling right or left (Touch dark color behind and move right or left), you can switch to another sheet.

1. Triangle main

AB	<input type="text" value="2."/>
BC	<input type="text" value="1."/>
CA	<input type="text" value="√3"/>
∠A	<input type="text" value="30° 0' 0."/>
∠B	<input type="text" value="60° 0' 0."/>
∠C	<input type="text" value="90° 0' 0."/>

2. Triangle sub

Altitude	<input type="text" value="√3"/>
Area	<input type="text" value="√3/2"/>
Perimeter	<input type="text" value="3 + √3"/>
Incircle Radius	<input type="text" value="-1/2 + √3/2"/>
Circumcircle Radius	<input type="text" value="1."/>
Classifying	<input type="text" value="Right"/>

3. Triangle coordinate

Point A x-coordinate	<input type="text" value="0."/>
Point A y-coordinate	<input type="text" value="0."/>
Point B x-coordinate	<input type="text" value="2."/>
Point B y-coordinate	<input type="text" value="0."/>
Point C x-coordinate	<input type="text" value="1_1/2"/>
Point C y-coordinate	<input type="text" value="√3/2"/>

4. Circle

Radius	<input type="text" value="3."/>
Diameter	<input type="text" value="6."/>
Perimeter	<input type="text" value="6π"/>
Area	<input type="text" value="9π"/>

5. Total calculation (2 items)

<input type="text" value="9."/>	<input type="text" value="×"/>	<input type="text" value="18."/>
<input type="text" value="18."/>	<input type="text" value="÷"/>	<input type="text" value="4."/>
<input type="text" value="4."/>	<input type="text" value="×"/>	<input type="text" value="12."/>
<input type="text" value="12."/>	<input type="text" value="÷"/>	<input type="text" value="210."/>

Thin color squares are either number input field or calculation result field. You can switch these by touch. (P.7)

Depending on window size, following items are switched.

Display length 10-digits or 14-digits, 1 sheet or 2 sheets pair, and vertical or horizontal.

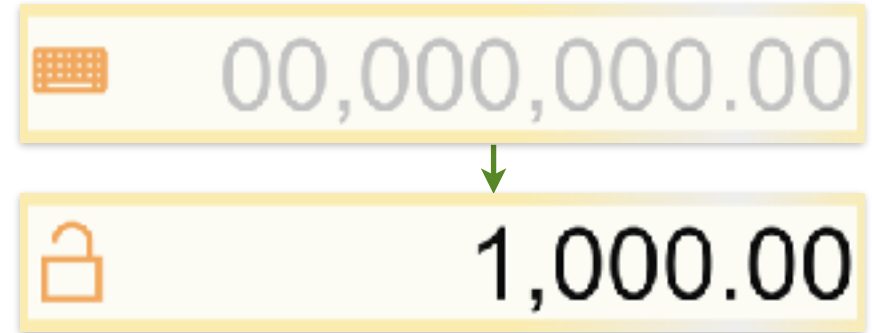
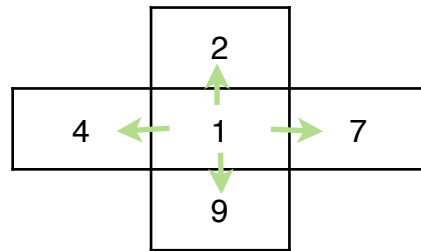
Number Input

There are 4 ways to input number. (①Touch to number itself ②Copy/Paste ③Software keyboard ④Hardware keyboard)

① Touch to number itself

In number input field, if it is initial state, input guide is dimmed.
(Right figure)

Touch directly the digit of the guide, the most significant digit of number you want to input. The digit changes to below table number depending on following action. (Release without move/Up/Down/Right/Left)
Operate slowly. Stop a moment after touching and then move.

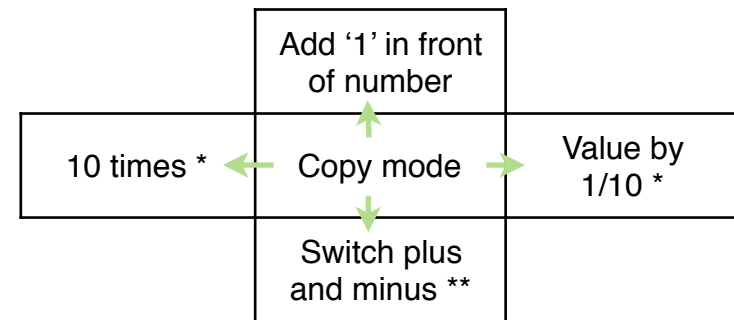


Adjust to aimed number by similar repeated touch actions to each digit.

After this, motion differs depending on whether on blank or on number, and following action. (Release without move/Up/Down/Right/Left)
On number, below left table operations work. Only when moving up or down, continuous operation works for adjusting the value.



On blank, below right table operations work.

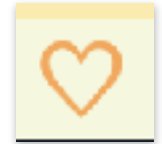


* mark function doesn't work on value including symbol, like fraction.

** mark function works only on value possible to be negative, like coordinate.

② Copy/Paste

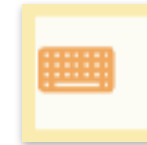
- (1) Touch and release on blank in front of the number you want to copy. Its color turns to thin.
- (2) Touch and release in destination number input field. The value (1) is pasted. The value is rounded following the settings (P.8).
Or touch again on the same (1). The value is stored in clipboard.
- (3) By a touch on blank in front of input guide, the value in clipboard is pasted.
In copy/paste operation, memory button (Right figure, bottom of sheet) is possible to use instead of number.
When memory holds a value, the symbol is filled.



- (4) **Copy/Paste of whole sheet:** Touch and release on dark color behind. Select from appearing popup menu.
(Selector is shown in the case only it works.)
By copy choice, whole sheet text is stored in clipboard. By paste choice on another sheet, the clipboard content is recalled on it.
And you can paste it into different application like Excel, NotePad.

③ Software keyboard

Keyboard (P.6) appears by touch to the left side button (Either of right figure) in the number field.



④ Hardware keyboard

You can use hardware keyboard for number input. If software keyboard is on screen, the key input is entered on it. Otherwise, the key input is entered in number input field with keyboard button (Right figure). When 2 sheets are on screen, left sheet is entered. Until [Enter] key press, the number is not fixed.

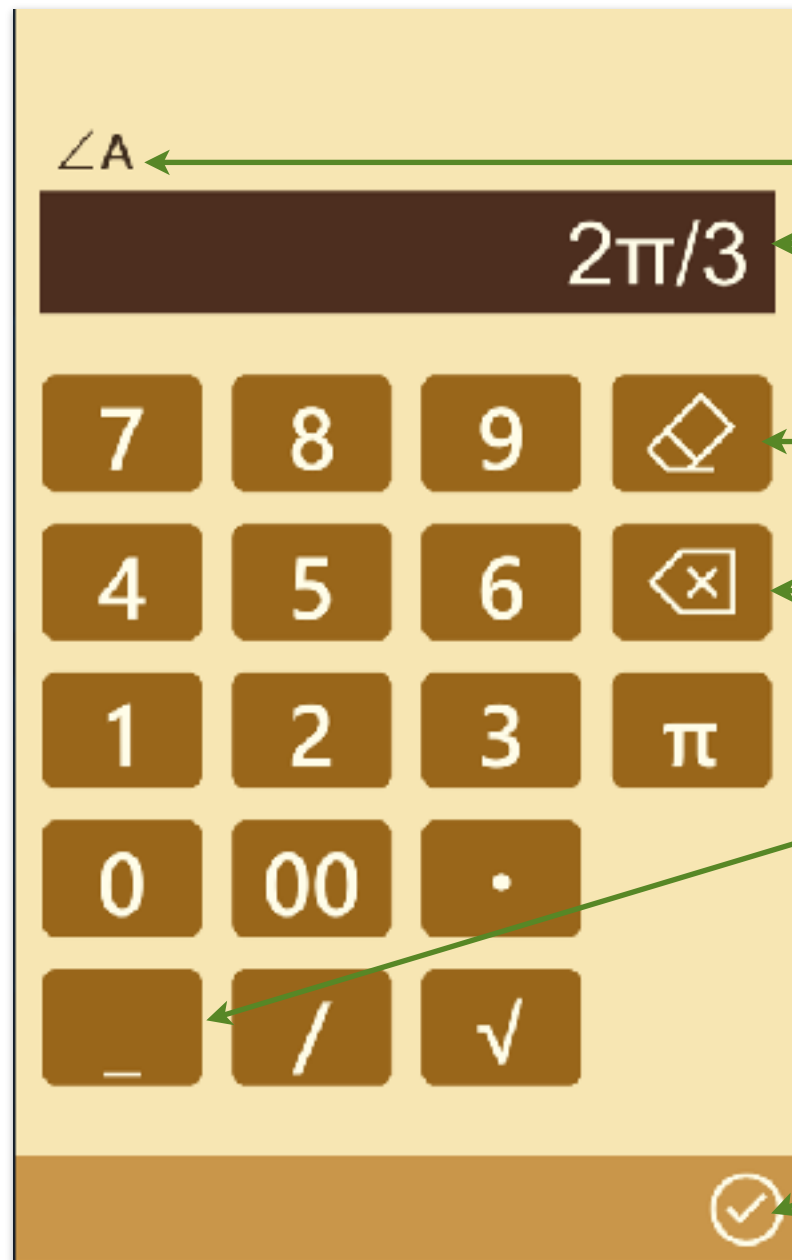


* Clear of number

By touch to the eraser button (Right figure, bottom right of sheet), whole sheet on screen is cleared.
As a prevention of calculation loss by miss touch, it doesn't work by short touch. Memory is held in this sheet clear action.
When you want to clear only one number or a memory, select it by the Copy/Paste(1) operation, and touch eraser button.



Keyboard



5 keyboards (degree/minute/second, coordinate, yard/feet-length, yard/feet-area, others) are equipped and suitable keyboard is automatically selected corresponding to the content. (Below is 'others' keyboard.)

Label of the inputting number.

This displaying number is stored. Touch correction to number is possible. After storing, it is rounded according to the setting (P.8). If it is blank, nothing is stored.

Clear inputted number. It doesn't work by short touch. (Hard key [Del])

Delete last 1 character.

Symbol keys vary depending on the keyboard.
 [] is a separator integer part of the mixed fraction.
 [/] is a separator between numerator and denominator.
 Right shown reference table to hard key of any keyboards consists from only hard things to guess from key top.

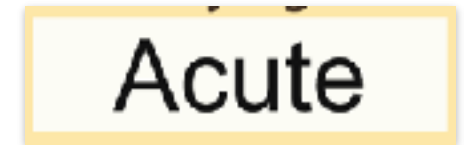
[√] → [R]
 [Π] → [P]
 [°] → [D]
 ['] → [M]
 ["] → [S]
 [00] → [Space]
 [+/-] → No

Finish number input and **quit** this sheet. (Hard key [Enter])

Other operations

* Selector:

Thin colored bottom square of the triangle sub sheet is a display of triangle shape. And it works as a selector (Right figure). You can choose from the defined contents by touch and following action (Release without move/Up/Down). It is referred in triangle calculation.

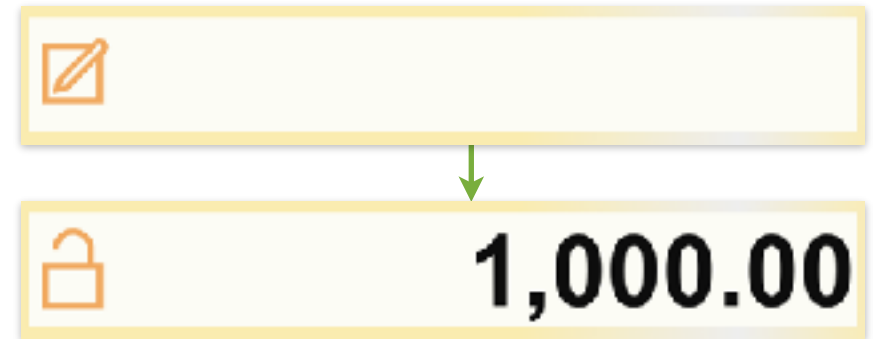


* Calculation result field

In calculation result field, before calculation, blank is displayed (Right figure).

At the time inputted number amount reaches to the possible level, the calculation is automatically done and the result is displayed when it is in the range.

The calculation result is rounded according to the setting (P.8) and displayed in thick.



Touch to calculation result field, regardless of blank or result, changes it to number input field.

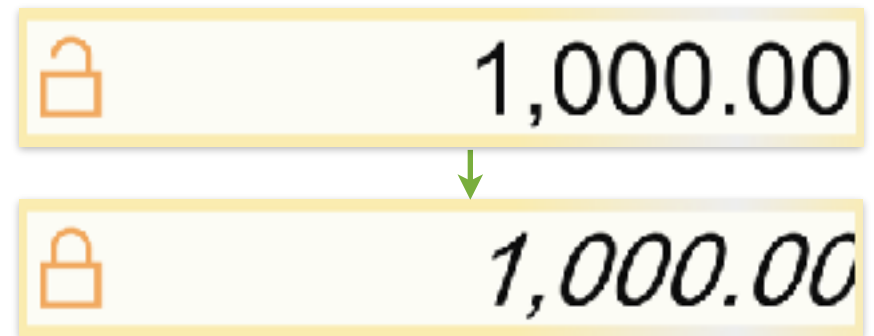
(However, there are cases logically impossible. Neither software keyboard nor lock button works in the situation.)

* Lock of number

Lock button is shown left side of both number inputted and calculated (Right figure). The number is locked by touch to the button.

The value is held while locking. However, it changes by reset or reload operation (P.8).

Re-touch to lock button releases this lock state. As a prevention of value change by miss touch, it doesn't work by short touch.



* Setting change

Settings sheet (P.8) appears by touch to the gear button (Right figure, bottom left of sheet).



Settings



Number is classified 3 kinds (Length/Area/Angle).
 Choose decimal part length for each.
 At '.' setting, fraction/irrational number is displayed as it is. Number is full digit display.(Until 10 or 14 digits. Digit is reduced depending on format.)

Length has 3 types (Normal, Feet/Inch, Yard/Inch).

Angle has 4 types (Degree/Minute/Second, Degree decimal, Radian, Gradian).

Rounding rule is same in all numbers. (Round down/Round off/Round up)

Separator location

- : 1234567890.
- 3-3-3 : 1,234,567,890.
- 2-2-3 : 1,23,45,67,890.
- 4-4-4 : 12,3456,7890.

Decimal point/Separator character

- Blank: Default of the unit
- ,. : 1,234,567,890.
- ., : 1.234.567.890,
- . : 1 234 567 890.
- , : 1 234 567 890,
- ' : 1'234'567'890.

Number type

19 type numbers are available and switched by touch.
 (Up/Down)

Reset: Use it only when you want to initialize this application.

Reload the situation this application started. It doesn't work by short touch.

Show this manual.

Finish these settings and **quit** this sheet.

Triangle Calculation

Triangle general shape can be seen by touch to the triangle button. (Right figure, bottom of sheet)
The ratio is automatically adjusted as large as possible within the screen. (Right bottom figure)
If no triangle calculation exists, triangle button is not filled and the sample triangle is displayed.



2 yellow sheets pair to calculate one triangle.

After entering three numbers, other values are automatically calculated.

- * 3 sides
- * 2 angles and one value except angle
- * 2 sides and one value except inscribed circle radius/circumscribed circle radius
- * 1 side, 1 angle and altitude or area (Some combinations are impossible to calculate.)

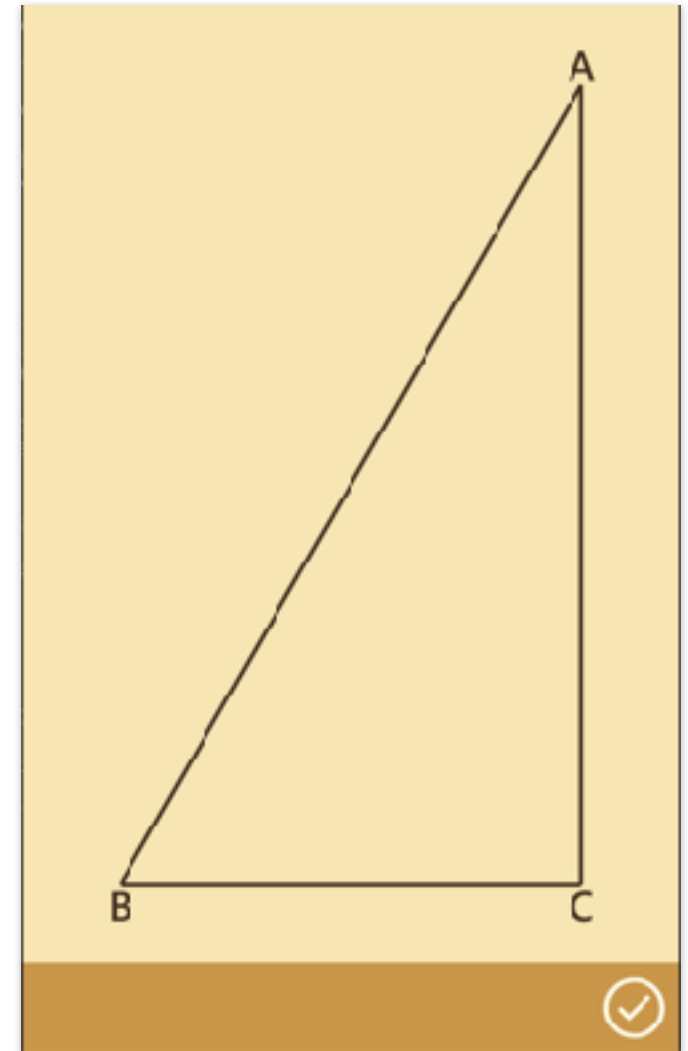
Green sheet is points coordinate of triangle. After following numbers are entered, triangle each values (on yellow sheets) are calculated automatically.

- * 3 points coordinates
- * 2 points coordinates and 1 side and 1 angle from either point
- * 2 points coordinates and 2 angles

Point coordinates are calculated in counterclockwise. (Right figure order)

Yellow sheet number calculated from green sheet values is fixed even if it is input field.

It is necessary to clear green sheet if you want to change it.



Modification history