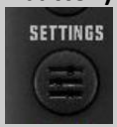


Let's set up the calculator				
Settings button (above the blue button) 	Calculator setting click ok	Input/output	Choose MathsI/DecimalO	Choose if you want to use the MathIO (recommended MathI decimalO) which allows for the fraction button to be used or put in equations in a line format
		Angle format	Choose degree	WHAT YOUR CALCULATOR MUST BE IN WHEN DOING PHYSICS USED FOR TRIG
		Number format	Choose either setting	
		Fraction results	Choose improper fraction	Do you want vulgar fractions or full numbers and fractions
		(down) Decimal mark	Choose dot	Should be set to dot, some countries use a comma instead of a dot in a number
		(down) Digit separator	Choose on	(this spreads out the number so it is easier to read).
Settings button (above the blue button)	system setting click ok	Contrast	Use the L and R arrows until the colour difference is good	
		Autopower off	10 mins except for exam then 60 mins	
		Multiline font	Normal font, unless you've really great eyesight!	
Catalog (the one with a book)Ca 	Catalogue->Numeric calc	Recurring decimal		
	Catalogue-> angle/coord/sexa_> rect to polar	Rect to Polar	Pol(adjacent,opposite)	**FOR USE WITH VECTORS RIGHT ANGLED TRIANGLES, Converts an X and Y to resultant and angle (but not a bearing) Does your trig for you. Enter Pol(ADJACENT,OPPOSITE) to get the comma press shift and then). Don't forget the) on the end** Answer gives r= hypotenuse θ = angle between adjacent and hypotenuse
	Catalogue-> angle/coord/sexa_>down arrow-> rect to polar	Polar to Rect	Rec(hypotenuese,angle)	FOR USE WITH VECTORS RIGHT ANGLED TRIANGLES, CONVERTS A VECTOR AND ANGLE TO X,Y **Enter Rec(hypotenuse,angle) to get the comma press shift and then). Don't forget the) on the end.** Answer gives adjacent (X) and then opposite (Y)

	When you have done your calculation you can decide how you want to display the answer.	 And down arrow And down arrow	Decimal	Allows you to change your answer to a decimal
			Recurring decimal	Will give you a recurring decimal DON'T USE unless you've got really good light
			Improper fraction	Can be useful if you want to hold over a value and don't want intermediate rounding errors.
			Mixed fraction	Not recommended
			ENG Notation	GREAT! Puts your answer to the power of 10 to a value that can be converted to a prefix, keep clicking the eng to move up powers of 3 or shift eng to move down, or use the right and left arrows to alter between the
			Sexagesimal	

Button/	How to get there	What is does
Sin, cos, tan	First buttons above the number keys. Mark sure calculator is in degrees	Only needs for the angle in vector questions
° ′ ″		Converts between hours, mins and second.
x10^x		Puts your answer to the power of 10, use for m, μ, k etc and the speed of light 3  8. **With this calculator it is probably best to bracket powers of 10!**
—	—	Fraction button RECOMMENDED to avoid problems of BODMAS and for resistance in parallel questions. BEWARE: https://www.youtube.com/watch?v=rEXWHcyMklo
Fix		This fixes the number of decimal places you want to display so will round up. Use this for individual questions only
Sci		Displays your answer in scientific notation, good when your answer requires this (lots of decimal places or a big number of sig fig etc
Norm		Cancels the Fix and Sci but you then select the type of input you want (see above)
Norm 1~2		Selects between maths or line
pol	Catalogue-> angle/coord/sexa_> rect to polar	**FOR USE WITH VECTORS RIGHT ANGLED TRIANGLES, Converts an X and Y to resultant and angle (but not a bearing) Does your trig for you.** **Enter Pol(ADJACENT,OPPOSITE) to get the comma press shift and then). Don't forget the) on the end**
Rec	Catalogue-> angle/coord/sexa_>down arrow-> rect to polar	FOR USE WITH VECTORS RIGHT ANGLED TRIANGLES, CONVERTS A VECTOR AND ANGLE TO X,Y **Enter Rec(hypotenuse,angle) to get the comma press shift and then). Don't forget the) on the end**
ANS	Find it two buttons below the blue shift button	This stores the answer so you can use this for additional parts of the calculation
x^{-1}		Puts your number/answer over 1 (eg in Resistance in parallel) Nowadays it is easier to use $\overline{ANS}$
π	Shift 7 now gets you pi!	 Can also get this through the catalog funtion, but why would you? It is a terrible place to get it! Catalog->down until you reacher "other"-> right arrow-> right arrow-> ok
Power button		For you powers, beware the shift and this button has limited use, especially when using powers of 10.
root		Direct algebraic logic states that you need to use this button before putting the number in. This button is the square root, Shift and this button allows for other roots such as cube root etc.

Polar to Rectangular, Rectangular to polar

This is what you can use for finding components of vectors or finding the resultant vector from its components. To explain the information on the right we do

Pol(adjacent,opposite) this gives the resultant and angle (you'll need to decide on how this fits in with the bearing)

Rec(hypotenuse,angle) this gives the adjacent and opposite in that order.

To find these buttons on the new calculators you need the catalogue (see the table) this will generate either **Pol(** or **Rec(.** Then add in the relevant number and **the comma is found by using shift+)**

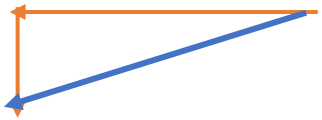
Eg. For a 3,4,5 triangle

Pol(3,4) = r=5 θ= 53.13, you will get a different angle if you put the Pol(4,3) so it must be the adjacent that goes first.

Let's try it the other way

Rec(5,53) = x (adj) 3.009075, y (opp) 3.993 (which I hope you can see would round to 4)

Try finding the resultant displacement for the following journey, A dog walks 12 m west in a straight line and then 5.0 m due south.

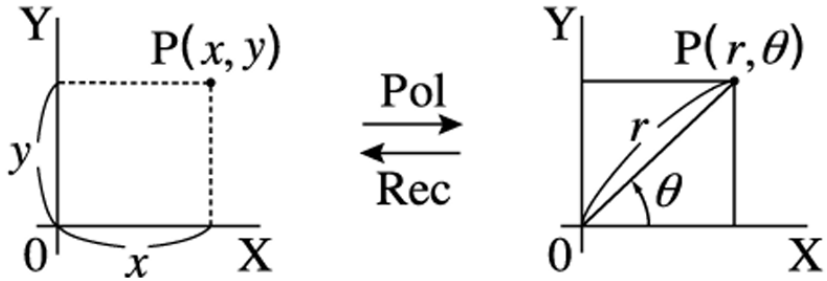


You ought to get r=13m, θ=23° But as for this as a bearing it is 23° below the 270° line so 270-23 = (247)

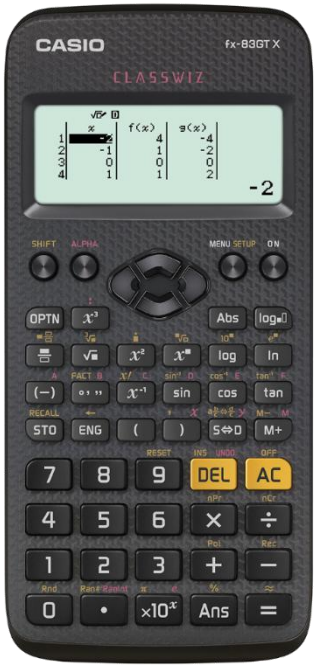
Rect to Polar, Polar to Rect

"Pol(" converts rectangular coordinates to polar coordinates, while "Rec(" converts polar coordinates to rectangular coordinates.

$\text{Pol}(x, y) = (r, \theta)$ $\text{Rec}(r, \theta) = (x, y)$

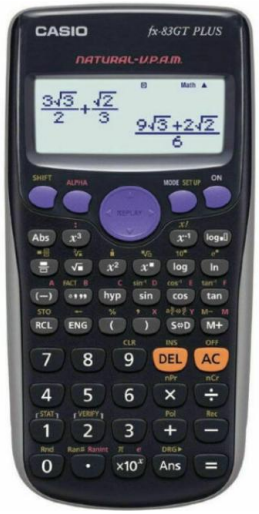


- Specify the Angle Unit on the SETTINGS menu before performing calculations.
- The calculation result for r and θ and for x and y are each stored respectively to variables x and y.
- Calculation result θ is displayed in the range of $-180° < \theta \leq 180°$.



Button/	How to get there	What is does
$x10^x$		Puts your answer to the power of 10, use for m, µ, k etc
ENG		Puts your answer to the power of 10 to a value that can be converted to a prefix, keep clicking the eng to move up powers of 3 or shift eng to move down
S↔D		Toggles between leaving your answer as a fraction or decimal
DEG		WHAT YOUR CALCULATOR MUST BE IN WHEN DOING PHYSICS USED FOR TRIG
RAD/Grad		DON'T LET YOUR CALCULATOR BE IN EITHER OF THESE
calculate		To work out a sum rather than statistics, the default setting
Input/output	Shift /set up 1	This decides if you want to use the MathIO (recommended MathI decimalO) which allows for the fraction button to be used or put in equations in a line format
Angle unit	Shift/set up 2	For checking your calculator is set to DEGREES
Digital separator	Shift/ set up / down twice/1/on	This breaks the number into 1000's so that it is easier to identify large and small numbers
Fix	Shift/ set up 3 /1	This fixes the number of decimal places you want to display so will round up. Use this for individual questions only
Sci	Shift/ set up 3 /2	Displays your answer in scientific notation, good when your answer requires this (lots of decimal places or a big number of sig fig etc
Norm	Shift/ set up 3 /3	Cancels the Fix and Sci but you then select the type of input you want (see above)
Norm 1~2		Selects between maths or line
Ab/c or d/c	Shift/ set up 4	Do you want vulgar fractions or full numbers and fractions
Recurring decimal	Shift / down. 3	I RECOMMEND THIS BEING OFF, IT GIVES YOU THE DOT WHICH YOU MIGHT NOT NOTICE
Decimal mark	Shift down 4	Should be set to dot, some countries use a comma instead of a dot in a number
pol	Shift +	Shift + number comma number bracket = FOR USE WITH VECTORS RIGHT ANGLED TRIANGLES, CONVERTS A VECTOR AND ANGLE TO X,Y
Rec	Shift -	**Shift – number comma number bracket = FOR USE WITH VECTORS RIGHT ANGLED TRIANGLES, Converts an X and Y to resultant and angle (but not a bearing)**
ANS		This stores the answer so you can use this for additional parts of the calculation
x^{-1}		Puts your number/answer over 1 (eg in Resistance in parallel)
Sin, cos, tan		Only needs for the angle in vector questions
° ′ ″		Converts between hours, mins and second
—		Fraction button RECOMMENDED to avoid problems of BODMAS

Button/	How to get there	What is does
x10^x		Puts your answer to the power of 10, use for m, μ, k etc
ENG		Puts your answer to the power of 10 to a value that can be converted to a prefix, keep clicking the eng to move up powers of 3 or shift eng to move down
S↔D		Toggles between leaving your answer as a fraction or decimal
DEG	Shift/ set up 3	WHAT YOUR CALCULATOR MUST BE IN WHEN DOING PHYSICS USED FOR TRIG
RAD/Grad	Shift/ set up 4 or 5	DON'T LET YOUR CALCULATOR BE IN EITHER OF THESE
calculate		To work out a sum rather than statistics, the default setting
MthIO	Shift /set up 1	This decides if you want to use the MathIO (recommended MathI decimalO) which allows for the fraction button to be used or put in equations in a line format
LineIO	Shift/set up 2	For checking your calculator is set to DEGREES
Number format		
Fix	Shift/ set up 6	This fixes the number of decimal places you want to display so will round up. Use this for individual questions only
Sci	Shift/ set up 7	Displays your answer in scientific notation, good when your answer requires this (lots of decimal places or a big number of sig fig etc
Norm	Shift/ set up 8	Cancels the Fix and Sci but you then select the type of input you want (see above)
Norm 1~2		Selects between maths or line
Ab/c or d/c	Shift/ set uo/ down 1 or 2	Do you want vulgar fractions or full numbers and fractions
Recurring decimal	Shift / set up/down. 4	I RECOMMEND THIS BEING OFF, IT GIVES YOU THE DOT WHICH YOU MIGHT NOT NOTICE
Decimal mark	Shift / set up/down. 5	Should be set to dot, some countries use a comma instead of a dot in a number
pol	Shift +	Shift + number comma number bracket = FOR USE WITH VECTORS RIGHT ANGLED TRIANGLES, CONVERTS A VECTOR AND ANGLE TO X,Y
Rec	Shift -	**Shift – number comma mumber bracket = FOR USE WITH VECTORS RIGHT ANGLED TRIANGLES, Converts an X and Y to resultant and angle (but not a bearing)**
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° ′ ″		Converts between hours, mins and second
▭		Fraction button RECOMMENDED to avoid problems of BODMAS



Prefix	Symbol	Multiple	Multiple in full
Tera	*T*	$x10^{12}$	x1 000 000 000 000
Giga	*G*	$x10^{9}$	x1 000 000 000
Mega	*M*	$x10^{6}$	x1 000 000
Kilo	k	$x10^{3}$	x1 000
BASE UNIT	_	_____	_____
Milli	m	$x10^{-3}$	÷1 000
Micro	μ	$x10^{-6}$	÷1 000 000
Nano	n	$x10^{-9}$	÷1 000 000 000
Pico	p	$x10^{-12}$	÷1 000 000 000 000

1. (**I**nformation)- Summarise the question.
2. Change any units that are not standard.
3. (**E**quation) -Write out the formula.
4. (**S**ubstitution) -Put the numbers in.
5. *Use the magic triangle to rearrange the formula, only if you must!*
6. (**S**olution)- Work out the answer.
7. Write out the answer, but not to too many sig fig.
8. (**U**nits) -Add units to your answer.
9. (**U**nderline) Underline the answer