CASIO CLASSPAD EXAMPLES INSTRUCTIONS:

BEFORE BEGINNING:

- Check Operating Software (OS) version – should be 3.03.3000 (or at least 3.02.3000)
  (Main Menu, System, System(at top of screen), Version (Software))
  If this needs to be upgraded, the latest version is available at http://edu.casio.com/dl/ .

- Check settings for the format that you need to do these examples
  (Main Menu, Main,   , Basic Format)

  Check Current folder = main
        Number format = Normal 1
        Angle = Degree
        Advanced,   ☑ descending order
  Choose Set.

- At the bottom of the Main screen, it should look like

  Anything that needs changing, simply tap on to toggle between the various available options.

EXAMPLES: (Refer Classpad Examples handout 28th April 2008)

1.   (a)

   Choose Main from Main Menu
   Choose Edit at top of screen and tap Clear All Variables and then Clear All to get a clear screen.
   Press Keyboard button on calculator keypad.

   Enter equation by tapping 5, select 2D tab, $x^\square$, $\boldsymbol{x}$, + 1 = ,   , enter numbers , EXE

   Highlight equation you originally entered, select Interactive from top of screen,
   Select Equation/Inequality, Solve, OK.

   (b)   From 2D tab, select   , 5,   , fill in numbers and variables, EXE.

   Highlight equation you originally entered, select Interactive from top of screen,
   Select Equation/Inequality, Solve, OK.

2.   Enter 3ln(x+2)   (ln from mth tab) , EXE

Highlight expression you originally entered, select Interactive from top of screen, select Calculation, tanLine, point = 4, OK.

To simplify, select Action from top of screen, Transformation, simplify, ans (from mth or 2d tab), EXE.

To graph function and tangent line, select   from top of screen. This turns on a set of axes in the bottom half of the screen.

Highlight 3.ln(x+2) in the top half of the screen and drag and drop onto axes.
Highlight tanline expression and drag and drop onto axes.

Adjust scale on the axes by selecting   from the top of the screen, selecting View Window and then adjusting the values accordingly.

You can select which half of the screen to work in (i.e. which is 'active') by tapping in the top half to work in the Main screen or in the bottom half to work in the Graph screen.

Tapping Resize at the very bottom of the screen toggles between a full screen and split screen display. Full screen depends on which of the two halves you had last tapped and made 'active'.

3.   At Main Menu, choose Spreadsheet.

Enter 1 in A1, 3 in A2 , 7 in A3

Highlight cell A4 by tapping in it. In the blank strip at the bottom of the screen to the left of the large ✓ X, enter =, tap cell A3 , − , tap cell A2 , + , tap cell A1 , + 5 , EXE.

Highlight cell A4 down to cell A22 by touching cell A4 with the stylus and dragging down the column without lifting the stylus until you reach cell A22.

Select Edit from top of screen, select Fill Range (should show A4:A22 in Range cell), select OK.

4.   Choose Main screen.

Turn on Keyboard.

Select 2D tab , select ⌷⌷⌷ .

Enter first function in top square to left of vertical line and second function in bottom square to left of vertical line.

In square to bottom right of vertical line, enter **x,y** , EXE.

5.   (a)   Enter function (without y =) , press EXE.

Highlight function you originally entered, select Interactive from top of screen, select Calculation, diff, OK.

To simplify, select Action from top of screen, Transformation, simplify, ans (from mth or 2d tab), EXE.

(b)   As above, but using fraction icon from 2D tab to input fractional expression.

6.   At Main Menu, select Geometry.

If there is anything on the screen, select File from top of screen and select New.

If the screen then still contains some axes, tap on the axes icon ⌷⌷⌷ at the top right of the screen until the axes disappear.

Then select ⌷⌷⌷ from the top left of the screen and click the down arrow to the right

of the pencil icon and select ⌷⌷⌷ , the line segment tool to the right of the pencil. Line segments are drawn by tapping one spot on the screen to make one end of the line and tapping another spot on the screen to make the other end. The line is then automatically drawn in between. The end points will be labeled with a letter.

Tap to make A and then tap elsewhere to make B.

Tap to make C and then tap to make D.

Tap C and then A to make line AC (be careful to be accurate when tapping A and C)

Tap B and then D to make line BD.

Select the selection tool in the top right corner of the screen and then tap in any unoccupied part of the screen to ensure that no part of the diagram is selected.

Select line AB by tapping on it. Tap the 'over the page' icon at the top right corner of the screen to change the options at the top of the screen.
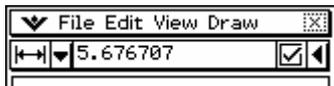
The line at the top of this screen will tell you the length of the currently selected line. We now want to set the length of this line to a specified length i.e. AB = 63.

Highlight the length currently shown, type in 63, EXE. Tap in any space away from the diagram to unselect the current line.

Select each line in turn and set the length you want each to be. Remember to tap in space away from the diagram to unselect each line once length has been set.

To set angle 70°, select lines AB and AC by tapping on each consecutively and set value to 70.

To find area of quadrilateral, tap on each of the four lines and the area will be displayed at the top of the screen.

7.   Make sure bottom of screen is set on Standard.

Enter $480 = \pi r^2 h$, EXE

(NOTE: Use VAR in either the mth tab or the 2D tab on the keyboard to input variables other than x, y, z. Avoid using the abc tab)

Highlight equation you originally entered, select Interactive from top of screen, Select Equation/Inequality, Solve, Variable = **h** (from the VAR menu) , OK.

The equation will be rearranged to make h the subject.

Type in, EXE

We now want to eliminate h from the equation for surface area above.

Select Action from top of screen, Equation/Inequality, eliminate

eliminate ($\underline{A = \pi r^2 + 2 \pi r h}$,   h , $h = \dfrac{\mathbf{480}}{\mathbf{r^2} \pi}$),   EXE

(The expressions for A and h can be copied from further up the screen by highlight each in turn, selecting Edit, Copy and then Paste)

Highlight equation for A and copy to beginning of next line.

Highlight this, select Interactive , Calculation, diff , variable = r , OK.

Copy this expression to beginning of next line and put = 0.

Highlight and select Interactive, Equation/Inequality, Solve, variable = r , OK.

Find equation for surface area back up the screen and copy and paste it to the bottom of the screen.
Select 'given that' symbol from mth tab, OPTN , |
Copy and paste r = ….. from up the screen to after the 'given that' symbol , EXE.

Minimum surface area will be shown in fraction form. To show answer as a decimal, tap ans (on keyboard), tap Standard at the bottom of the screen (changes to decimal) and tap EXE.

8.   Check bottom of screen is set on Standard.

Enter function, EXE

Either	Highlight original function, select Interactive, Calculation, $\int$, OK	or	On keyboard select 2D tab, Calc, highlight function, drag and drop into approp position, enter **x** after d , EXE

Enter nothing in the limits boxes.

9. Solve $1 + x = x^2 - 5$ to find boundaries of enclosed region.

Enter equation $1 + x = x^2 - 5$, EXE

Highlight equation you originally entered and select Interactive, Equation/Inequality , Solve, OK. Gives -2 , 3

Turn graph on by tapping at the top right of the screen.

Highlight $1 + x$ above and drag and drop onto axes.

Highlight $x^2 - 5$ above and drag and drop onto axes.

Can determine which function is on top. Alter scale on axes by accessing View Window as described on page 2, if necessary.

Tap top half of screen to make Main screen active.

Select 2D tab , Calc, tap , enter function and boundaries in appropriate parts of

the template. Tap EXE.

10.   At Main Menu, select Geometry.

Select File, New.

Turn axes on by tapping [icon] , (no dots). Set View window to xmin $= -0.5$,

xmax $= 25$, ymid $= 1$, OK

Select vector drawing tool by tapping on [icon] and then selecting [icon] .

Tap on the origin and then tap out roughly where you think the first vector will go. This vector will be labeled r . Repeat this process to draw the second vector s.

We will let s represent the stationary point B and r represent the path of the moving body A.

Tap the selection tool [icon]

Tap vector s to select it and tap the 'over the page' icon at the top right corner of the screen. Vector coordinates will be shown for vector s.

Highlight this pair of values and enter (20,6) , EXE

Tap away from vector s to unselect it and tap on vector r. Highlight coordinate values and enter (8,6) , EXE

With vector r selected, now tap on the righthand end of vector r to select that point.

Then turn back over the page by tapping the 'over the page' icon and tap on the arrow to

the right of [icon] in the tools at the top of the screen. Tap on the parallel lines tool

and vector r will be 'elongated'.

Tap away from the vectors to unselect vector r and the point on its end.

Select vector r again and the point on the righthand end of vector s.

Go to the icon where you found the parallel line tool, tap the down arrow to access all the options and select the perpendicular line tool on the RIGHT. A line will then be drawn which is perpendicular to vector r passing through the point representing stationary point B.

Tap the 'over the page' icon and the length of the line segment from point B to the vector representing the path of body A will be shown.

11. Select Main screen

(Condition shown on handout should read $t = -5$)

Enter   p ' = 0.015 p , EXE   (' is in mth tab, CALC)

Highlight equation you originally entered and select Interactive, Equation/Inequality , dSolve .

Select Include Condition.

Indep Var = **t**   Depe Var = **p**   Condition **t = −5**   Condition **p = 7600**

(It doesn't appear to matter which order the two conditions are entered)

To solve for t = 10 , highlight function and copy down the page , select 'given that' symbol from mth tab, OPTN , t = 10 , EXE

To get solution as decimal , tap 'ans' on keyboard , tap Standard at bottom of screen to change to decimal and tap EXE.

12. Make sure set on Standard at bottom of screen.

EITHER

Enter function $\dfrac{\mathbf{x}}{\mathbf{1 + x^2}}$, EXE

Highlight expression you originally entered , select Interactive, Calculation, ∫ , EXE

Type in   y $= \dfrac{\mathbf{\ln(x^2 + 1)}}{\mathbf{2}} + c \mid x = 1 \mid y = \ln(2)$ (do not tap EXE)

(this expression can
be copied down the page)

Highlight all of what you have just entered , select Interactive , Equation/Inequality , solve , variable = c , OK

OR

Enter y ' $= \dfrac{\mathbf{x}}{\mathbf{1 + x^2}}$, highlight whole equation.

Select Interactive , Equation/Inequality , dSolve , select Include Condition

Indep Var = **x**   Depe Var = **y**   Condition **x** = 1   Condition **y** = ln(2)   OK

13.   At Main Menu, select Geometry

If there is anything on the screen, select File from top of screen and select New.

If the screen then still contains some axes, tap on the axes icon ⊞ at the top right of the screen until the axes disappear.

Then select ✎ from the top left of the screen and click the down arrow to the right

of the pencil icon and select ╱ , the line segment tool to the right of the pencil. Line segments are drawn by tapping one spot on the screen to make one end of the line and tapping another spot on the screen to make the other end. The line is then automatically drawn in between. The end points will be labeled with a letter.

Tap to make A and then tap elsewhere to make B.

Tap A and then tap to make C.

Tap B and then C to make line BC (be careful to be accurate when tapping B and C)

Tap B and then tap elsewhere to make D giving line BD.

Select the selection tool ▼F ▶ in the top right corner of the screen and then tap in any

unoccupied part of the screen to ensure that no part of the diagram is selected.

Select line AC by tapping on it. Tap the 'over the page' icon ⊞ at the top right corner of the screen to change the options at the top of the screen.

|↦|▼|5.676707 |☑|◀|
▼ File Edit View Draw   ⊠

The line at the top of this screen will tell you the length of the currently selected line. We now want to set the length of this line to a specified length i.e. AC = 11.

Highlight the length currently shown, type in 11, EXE. Tap in any space away from the diagram to unselect the current line.

Select each line in turn and set the length you want each to be. Remember to tap in space away from the diagram to unselect each line once length has been set.

Ensure that no lines are selected, then select line AC and the point C.

Then turn back over the page by tapping the 'over the page' icon and tap on the arrow to

the right of ⊥ in the tools at the top of the screen. Tap on the parallel lines tool

and line AC will be 'elongated'.

Tap away to ensure that no lines are selected, then select line AC and point D.

Tap the 'over the page' icon.

Clicking the down arrow next to the line measurement will show two options.
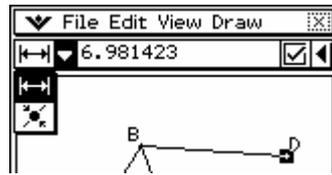
- the first shows the length of the distance between the selected objects (here the line AC and the point D)
- the second shows whether the objects are touching or not.

To get point D to be exactly on line AC either

- make distance in first option 0 and tap EXE

Or - change 'No' to 'Yes' in second option by tap on the 'tick in a box' to the right of the 'No'.
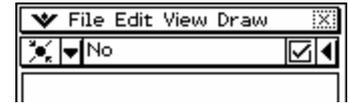
To find the value of the angle marked θ in the question diagram, ensure all lines and points are unselected and then select AC and BD and the angle between them will be shown.

14. Function in question should say $y = \sqrt{12} - x^2$

In Main screen

Enter area expression $x(\sqrt{12} - x^2)$, EXE

Highlight the expression you originally entered, select Interactive, Calculation , diff , OK.

Highlight solution and copy down page.

Put expression = 0 , highlight the whole equation , select Interactive, Equation/Inequality, solve, OK.

Tap 'ans' , change Standard to decimal at the bottom of the screen, EXE - to get solutions in decimal form.

Up the page, highlight original expression for the area and copy down the page , put in 'given that' symbol (mth tab, OPTN) , copy positive solution value from up the page and paste after 'given that' symbol, EXE.