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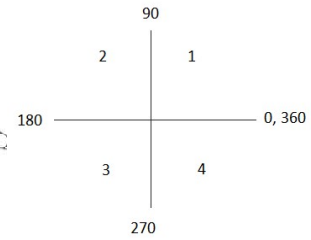
A LEVEL MATHS

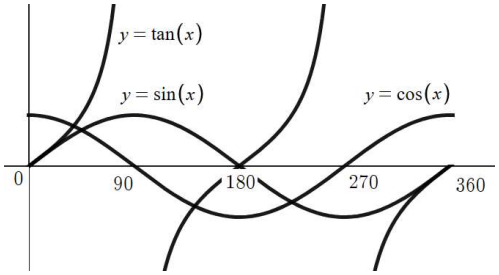
(51) The 'CAST' Diagram for Trig Ratios

WORKING AT D/E

(1) The diagram below shows the '4 quadrants' from 0 to 360 degrees moving anticlockwise from 0. This is **sometimes** called the CAST diagram.



The diagrams below show the graphs of $y = \sin(x), y = \cos(x)$ and $y = \tan(x)$ **on the same set of axes.**



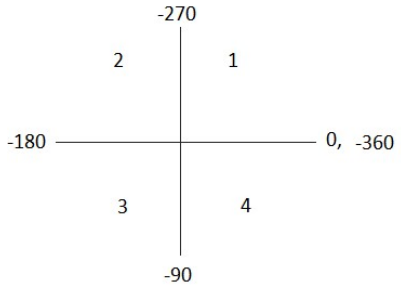
(a) Label each graph above.
(b) Using the graphs, **or otherwise**, write where each trigonometric function is positive on the diagram above with the 4 quadrants.

(2) The value of $\cos(a) = -0.1$. Which two quadrants could it be in?

WORKING AT B/C

(1) For the following statements, write down the 2 quadrants the value will lie in. DO NOT CALCULATE THE ANGLE. The first one is done for you.
(a) $\sin(x) = -0.25$. This is the 3rd and 4th quadrant.
(b) $\cos(x) = 0.4$
(c) $\tan(x) = 3$
(d) $\cos(x) = -\frac{1}{5}$
(e) $\sin(x) = 0.63$

(2) You can also use the 4 quadrants for negative values by reading clockwise from 0.



Using the diagram above **or otherwise**, write down whether the following values will be positive or negative. DO NOT USE A CALCULATOR TO WORK OUT THEIR VALUE.
(a) $\sin(-80^o)$
(b) $\cos(-28^o)$
(c) $\tan(-100^o)$
(d) $\sin(-320^o)$

(3) Given that both $\sin(a)$ and $\cos(b)$ are negative, write down which quadrant they will be in.

WORKING AT A*/A

(1) Express each of the following in terms of either $\sin(x), \cos(x)$ or $\tan(x)$.
(a) $\sin(-x)$
(b) $\cos(-x)$
(c) $\tan(-x)$
(d) $\sin(-180 + x)$
(e) $\cos(-360 + x)$