

# PC 12 LG 10 Worksheet (Trig Proofs)

1. Show that the LHS is equal to the RHS

a.  $\frac{1}{s} + \frac{1}{c} = \frac{c+s}{cs}$

b.  $\frac{1}{c} - \frac{1}{s} = \frac{s-c}{cs}$

c.  $\frac{1}{s} \times \frac{1}{c} = \frac{1}{cs}$

d.  $\frac{1}{s} \div \frac{1}{c} = \frac{c}{s}$

e.  $\frac{\frac{1}{s}}{\frac{1}{c}} = \frac{c}{s}$

f.  $\frac{\frac{1}{s}}{\frac{1}{s^2}} = s$

g.  $\frac{\frac{1}{c^2}}{\frac{1}{c}} = \frac{1}{c}$

h.  $\frac{\frac{1}{c}}{\frac{1}{s}} = \frac{s}{c}$

i.  $\frac{c^2s}{cs^2} = \frac{c}{s}$

j.  $\frac{2c^2s^2}{2cs} = cs$

k.  $(c+s)^2 = c^2 + s^2 + 2sc$

l.  $(c+s)(c-s) = c^2 - s^2$

2. Show the LHS = RHS (Hint: factor!)

a.  $\frac{c^2-1}{c-1} = c+1$

b.  $\frac{c^2+2c+1}{c^2-1} = \frac{c+1}{c-1}$

c.  $\frac{cs+c^2}{s+c} = c$

d.  $\frac{cs+s^2}{c^2+sc} = \frac{s}{c}$

e.  $\frac{c+s}{c^2-s^2} = \frac{1}{c-s}$

f.  $\frac{c^2-s^2}{c-s} = c+s$

3. Show the LHS = RHS (Hint: complex fractions!)

a.  $\frac{\frac{1}{s} + \frac{1}{c}}{\frac{1}{s} - \frac{1}{c}} = \frac{c+s}{c-s}$

b.  $\frac{\frac{1}{s} + 1}{\frac{1}{s} - 1} = \frac{1+s}{1-s}$

c.  $\frac{1 - \frac{1}{c}}{1 + \frac{1}{c}} = \frac{c-1}{c+1}$

d.  $\frac{s - \frac{1}{c}}{s + \frac{1}{c}} = \frac{sc-1}{sc+1}$

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4. Show the LHS = RHS (Hint: add fractions!)

a.  $\frac{1}{c} + \frac{1}{c+1} = \frac{2c+1}{c(c+1)}$

b.  $\frac{1}{c} - \frac{1}{c+s} = \frac{s}{c(c+s)}$

c.  $\frac{1}{c+1} + \frac{1}{c-1} = \frac{2c}{(c+1)(c-1)}$

5. Show the LHS = RHS (Hint: complex & factor!)

a.  $\frac{1 + \frac{s}{c}}{1 + \frac{c}{s}} = \frac{s}{c}$

b.  $\frac{\frac{c}{1}}{\frac{1}{c} - 1} = \frac{c^2}{1-c}$

c.  $\frac{\frac{1}{c}}{\frac{s}{c} - \frac{1}{c}} = \frac{1-s^2}{cs}$

d.  $\frac{\frac{s}{c}}{1 + \frac{s}{c}} = \frac{s}{c+s}$

e.  $\frac{\frac{1}{s} - \frac{1}{c}}{\frac{c}{s}} = \frac{c-s}{c^2}$

b.  $\frac{\frac{c}{s}}{\frac{c}{s}} = 1$

e.  $\frac{s + \frac{s}{c}}{c+1} = \frac{s}{c}$

6. Write each fraction with a common denominator.

(Scott O'Neill Rule)

a.  $\frac{c}{s}, \frac{s}{c}$

b.  $\frac{1}{c+1}, \frac{1}{c-1}$

c.  $\frac{1}{c+s}, \frac{1}{c-s}$

d.  $\frac{s}{1-c}, \frac{1+c}{s}$

e.  $\frac{c}{c+s}, \frac{c-s}{c}$

## Answer Key

a.  $\frac{c^2}{sc}, \frac{s^2}{sc}$

b.  $\frac{c-1}{(c+1)(c-1)}, \frac{c+1}{(c+1)(c-1)}$

c.  $\frac{c-s}{(c+1)(c-1)}, \frac{c+s}{(c+1)(c-1)}$

d.  $\frac{s^2}{s(1-c)}, \frac{1-c^2}{s(1-c)}$

e.  $\frac{c^2}{c(c+s)}, \frac{c^2-s^2}{c(c+s)}$