[Name of the Writer]

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[Subject]

[Date]

Math hw

**5- (cos2θ/ sinθ) + sinθ = cotθ/ secθ**

**LHS: Left Hand Side**

**RHS: Right Hand Side**

LHS= (Cos2θ/ sinθ) + sinθ

 Cos2θ = cos2θ-sin2θ

= ((cos2θ – sin2θ)/ sinθ) + sinθ

= (cos2θ – sin2θ + sin2θ)/ sinθ

= cos2θ/ sinθ

= (cosθ/ sinθ)\* cosθ

 cosθ/ sinθ=cotθ and cosθ=1/ secθ

= cotθ/ secθ = RHS

Hence proved LHS = RHS

**6- tanθ + cotθ = 2/ sin2θ**

LHS= tanθ + cotθ

 tanθ = sinθ/ cosθ and cotθ = cosθ/ sinθ

= sinθ/ cosθ + cosθ/ sinθ

= (sin2θ + cos2θ)/ sinθcosθ

 sin2θ + cos2θ = 1

= 1/ sinθcosθ

Multiply and divide by 2

=2/ 2sinθcosθ

 sin2θ = 2sinθcosθ

=2/ sin2θ = RHS

Hence proved LHS = RHS

**7- sin2θ = 2tanθ/ (1 + tan2θ)**

RHS= 2tanθ/ (1 + tan2θ)

 tanθ = sinθ/ cosθ

= 2 (sinθ/ cosθ)/ (1 + sin2θ/ cos2θ)

= 2 (sinθ/ cosθ)/ ((cos2θ + sin2θ)/ cos2θ)

 sin2θ + cos2θ = 1

= 2 (sinθ/ cosθ)/ (1/ cos2θ)

=2 (sinθcos2θ / cosθ)

=2sinθcosθ

 sin2θ = 2sinθcosθ

= sin2θ = LHS

Hence proved LHS = RHS

**8- cos2θ = (1 - tan2θ)/ (1 + tan2θ)**

RHS= (1 - tan2θ)/ (1 + tan2θ)

 tanθ = sinθ/ cosθ

= (1 - (sin2θ/ cos2θ))/ (1 + (sin2θ/ cos2θ))

= ((cos2θ - sin2θ)/ cos2θ)/ ((cos2θ + sin2θ)/ cos2θ)

 cos2θ + sin2θ = 1 & cos2θ - sin2θ= cos2θ

= (cos2θ/ cos2θ)/ (1/ cos2θ)

= cos2θ = LHS

Hence proved LHS = RHS

**9- sin2θsec2θ = 2tanθ**

LHS= sin2θsec2θ

 sin2θ= 2sinθcosθ and sec2θ= 1+ tan2θ

= 2sinθcosθ (1+ tan2θ)

 tanθ= sinθ/ cosθ

= 2sinθcosθ + 2sinθcosθ (sin2θ/ cos2θ)

= (2sinθcos3θ + 2 sin3θcosθ)/ cos2θ

= (2sinθcosθ (cos2θ + sin2θ))/ cos2θ

 cos2θ + sin2θ = 1

= 2sinθcosθ/ cos2θ

= 2sinθ/ cosθ

 tanθ= sinθ/ cosθ

=2tanθ = RHS

Hence proved LHS = RHS

**10- 2 - sec2θ = cos2θsec2θ**

LHS= 2 - sec2θ

 sec2θ = 1 + tan2θ

= 2 – (1 + tan2θ)

= 1 – tan2θ

 tanθ = sinθ/ cosθ

= 1 – (sin2θ/ cos2θ)

= (cos2θ - sin2θ)/ cos2θ

 cos2θ - sin2θ= cos2θ and sec2θ= 1/ cos2θ

= cos2θsec2θ = RHS

Hence proved LHS = RHS

**11- (cosθ – sinθ)2 = 1 - sin2θ**

LHS= (cosθ – sinθ)2

= cos2θ + sin2θ – 2sinθcosθ

 cos2θ + sin2θ= 1 and sin2θ = 2sinθcosθ

= 1 - sin2θ = RHS

Hence proved LHS = RHS

**12- (cosθ + sinθ)2 = 1 + sin2θ**

LHS= (cosθ + sinθ)2

= cos2θ + sin2θ + 2sinθcosθ

 cos2θ + sin2θ= 1 and sin2θ= 2sinθcosθ

= 1 + sin2θ = RHS

Hence proved LHS = RHS

**13- (2sin2θ/ sin2θ) + cotθ = secθcscθ**

LHS= (2sin2θ/ sin2θ) + cotθ

 sin2θ = 2sinθcosθ and cotθ = cosθ/ sinθ

= (2sin2θ**/** 2sinθcosθ) + cosθ/ sinθ

= (sinθ/ cosθ) + (cosθ/ sinθ)

= (sin2θ + cos2θ)/ cosθsinθ

 sin2θ + cos2θ = 1

= 1/ cosθsinθ

 secθ = 1/ cosθ and cscθ = 1/ sinθ

= secθcscθ = RHS

Hence proved LHS = RHS

**14- cos2θ = (cot2θ -1)/ (cot2θ + 1)**

RHS= (cot2θ -1)/ (cot2θ + 1)

 cotθ = cosθ/ sinθ

= ((cos2θ/ sin2θ) – 1)/ ((cos2θ/ sin2θ) + 1)

= ((cos2θ - sin2θ)/ sin2θ)/ ((cos2θ + sin2θ)/ sin2θ)

 cos2θ =cos2θ - sin2θ and cos2θ + sin2θ= 1

= cos2θ = LHS

Hence proved LHS = RHS