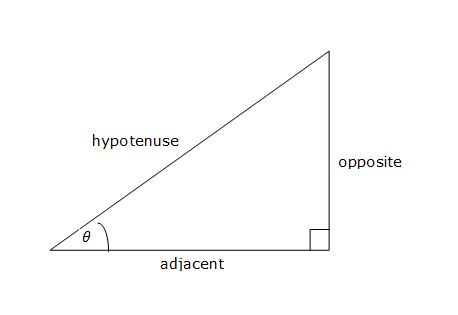
**Trigonometry**

**Important Formulae**

1. **Right Triangle Definition**

Assume that:

0 < < or 0 < < 90

sin = cosec =

cos = sec =

cos= cot =

1. Tangent cotangent Identities

tan = cot =

1. Reciprocal Identities

sin = cosec =

cos = sec =

tan = cot =

1. Pythagorean Identities

sin2 + cos2 = 1

tan2 + 1 = sec2

1 + cot2 = cosec2

1. Even and Odd Formulas

sin (-) = - sin cosec (- = - cosec

cos(- = cos sec(- = sec

tan (- = - tan cot (- = - cot

1. Double Angle Formulas

sin(2 = 2 sin cos

cos (2) = cos2 - sin2

= 2 cos2 - 1

= 1 – 2 sin2

tan (2) =

1. Half Angle Formulas

sin =

cos =

tan

1. Sum and Difference Formulas

sin (A B) = sinA cosB cosA sinB

cos (A B) = cosA cosB sinA sinB

tan (A B) =

1. Product to Sum Formulas

sinA sinB = [cos (A - B) – cos (A + B)]

cosA cosB = [cos (A - B) + cos (A + B)]

sinA cosB = [sin (A + B) + sin (A - B)]

cosA sinB = [sin (A + B) - sin (A - B)]

1. Sum to Product Formulas

sinA + sinB = 2 sin () cos ()

sinA - sinB = 2 cos () sin ()

cosA + cosB = 2 cos () cos (

cosA - cosB = - 2 sin () sin (

1. Co function Formulas

Sin () = cos cos () = sin

cosec () = sec sec () = cos

tan () = cot cot () = tan

1. C:\Users\tsuser.PC\Desktop\final.pngSin225 + sin265 =?   
   a) b) 1 c) 0 d)
2. C:\Users\tsuser.PC\Desktop\final.pngCos4– sin4=  , 1 – 2sin2 = ? a) b) 1 c) 0 d)
3. C:\Users\tsuser.PC\Desktop\final.pngIf sin (60 - ) = cos ( - 30), then the value of tan ( - ) is ( assume that and are both positive acute angles with < 60 and > 30).   
   a) b) 0 c) d) 1
4. C:\Users\tsuser.PC\Desktop\final.png = ?   
   a) tan 33cot 53 b) tan 53 cot 33   
   c) tan 33 cot 57 d) tan 57 cot 37
5. C:\Users\tsuser.PC\Desktop\final.pngIf tan + cot= 2, then the value of tann+ cotn= ? (0<< 90 , n is an integer) is   
   a) 2 b) 2n c) 2n d) 2n+1
6. C:\Users\tsuser.PC\Desktop\final.pngif sec+ tan =(0 ≤ 0 ≤ 90) , then tan 3is   
   a) Undefined b) c) considered as infinity d)
7. C:\Users\tsuser.PC\Desktop\final.pngIf 5tan = 4, then the value of () is\_   
   a) 1/7 b) 2/7 c) 5/7 d) 2/5
8. C:\Users\tsuser.PC\Desktop\final.pngIf sec + tan = 2 + , then the value of sin + cosis a) b) c) d)
9. C:\Users\tsuser.PC\Desktop\final.pngIf cos+ sin = cos, thencos– sin is   
   a) tan b) - tan c) - sin d) sin
10. C:\Users\tsuser.PC\Desktop\final.pngThe value of – is   
    a) 1 b) cot c) cosecd)tan
11. C:\Users\tsuser.PC\Desktop\final.pngIf tan = n tan and sin = m sin , then cos2 is   
    a) b) c) d)
12. C:\Users\tsuser.PC\Desktop\final.pngIf x = cosec – sin and y = sec – cos then the value of x2y2 (x2 + y2 +3) is\_   
    a) 0 b) 1 c) 2 d) 3
13. C:\Users\tsuser.PC\Desktop\final.pngIf sin + sin2 = 1, then the value of cos12 + 3 cos10 + 3cos8 + cos6 – 1 is \_   
    a) 0 b) 1 c) -1 d) 2
14. C:\Users\tsuser.PC\Desktop\final.pngThe value of 152 (siin30 + 2cos245 + 3sin30 + 4cos245 + …. + 17 sin30 + 18cos2 45 ) is   
    a) An integer but not a perfect square b) A rational number but not an integer   
    c) A perfect square of an integer d) Irrational
15. C:\Users\tsuser.PC\Desktop\final.pngFind the value of tan 1 tan 2 tan 3 … tan 89   
    a) 1 2) -1 c) undefined d) 0
16. C:\Users\tsuser.PC\Desktop\final.pngThe value of cos 1 cos 2 cos 3 …. Cos 177 cos 178 cos 179 is   
    a) 0 b) c) 1 d)
17. C:\Users\tsuser.PC\Desktop\final.pngFind the minimum value of 2sin2 + 3 cos2

a) - b) 2 c) 3 d) 5

1. C:\Users\tsuser.PC\Desktop\final.pngThe least value of (4 sec2 + 9 cosec2) is\_   
   a) 1 b) 19 c) 25 d) 7
2. C:\Users\tsuser.PC\Desktop\final.pngFind the minimum value of sin2 + cos2 + tan2+ tan2 + cot2+ cosec2)a) 1 b) 3 c) 5 d) 7
3. C:\Users\tsuser.PC\Desktop\final.pngIf is a positive acute angle and tan 2. tan 3= 1, then find the value of (2cos = 1)

a) 0 b) c) d) 1

1. C:\Users\tsuser.PC\Desktop\final.pngIf sin 17= , then (sec 17 - sin 73) =?   
   a) b) c) d)
2. C:\Users\tsuser.PC\Desktop\final.pngIf sin () = x2 + , then what is the value of (x - )   
   a) 1 b) 0 c) -1 d) 2
3. If x, y are positive acute angles, x + y < 90 and sin (2x - 20) = cos(2y + 20), then the value of sec (x+y) is\_   
   a) √2 b) 1 / √2 c) 1 d) 0
4. If tan (x+y) tan (x-y)=1, then the value of tan (2x/3) is\_   
   a) 1/√3 b) 2 /√3 c) √3 d) 1
5. If 0 ≤ ≤ /2, 2y cos = x sin and 2x sec – y cosec = 3, then the value of x2 + 4y2 is\_   
   a) 1 b) 2 c) 3 d) 4
6. If tan = ¾ and is acute, then cosec is   
   a) 4/5 b) 5/3 c) 5/4 d) 4/3
7. The value of + is   
   a) ¼ b) 1 c) 2 d) ½
8. Evaluate : 3 cos 80 cosec 10 + 2 cos 59 cosec 31   
   a) 1 b) 1 c) 2 d) 5
9. If tan + cot = 2, then the value of tan2 + cot2 is -   
   a) 2 b) 1 c) √2 d) 0
10. The value of [+ ] (sec2A –cosec2 A) is -   
    a) 1 b) 3 c) 2 d) 4
11. If cosec 39 = x, the value of + sin239 + tan251 - is   
    a) b) c) x2 – 1 d) 1 – x2
12. The value of tan4.tan 43 . tan47 . tan 86 is   
    a) 2 b) 3 c) 1 d) 4
13. = 2, (0 ≤ ≤ 90), then the value of sin is   
    a) b) c) d) 1
14. If sec2 + tan2 = , then sec4 – tan4 =   
    a) b) c) d) 1
15. If 0 < x < and sec x = cosec y, then the value of sin (x+ y) is:   
    a) 0 b) 1 c) d)
16. If A,B and C be the angles of a triangle, then of the following the incorrect relation is:   
    a) sin () = cos b) sin ( = sin   
    c) tan (= cot d) cot () = tan
17. The measures of the angles of a triangle are in the ratio 2:7:11 . Measures of angles are   
    a) 16, 56, 88 b) 18, 63, 99   
    c) 20, 70, 90 d) 25, 175, 105
18. If sin + cot= 2 (0< 90) , then sin ()   
    a) sin b) cos c) sin d) cos
19. If cos4– sin4 = , then the value of 2 cos2 – 1 is   
    a) 0 b) 1 c) d)
20. If sinsec (30 + ) = 1 (0 << 60), then the value of sin + cos2 is   
    a) 1 b) c) 0 d)
21. If tan = 1, then the value of is   
    a) 2 b) 2 c) 3 d)
22. If be a positive acute angle satisfying cos2 + cos4 = 1, then the value of tan2 + tan4 is   
    a) b) 1 c) d) 0
23. If tan  = , then the value of is   
    a) 0.5 b) -0.5 c) 3.0 d) -3.0
24. The simplified value of (sec A – cosA)2 + (cosec A- sinA)2 – (cotA – tanA)2   
    a) 0 b) c) 1 d) 2
25. The value of sin21 + sin25 + sin29 + … + sin289 is   
    a) 11 b) 11 c) 11 d)
26. The numerical value of cot18 (cot72 cos222 + ) is   
    a) 1 b) c) 3 d)
27. If sin – cos= and 0 << 90 ) the value of sin + cos is   
    a) b) c) d)
28. If 2 cos - sin = , (0<< 90 ) the value of 2sin + cos is   
    a) b) c) d)
29. If = 3, then the value of sin4 – cos4 is   
    a) b) c) d)
30. If sec2+ tan2= 7 , then the value of when 0 90, is   
    a) 60 b) 30 c) 0 d) 90

**Answers**

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 1 - b | 2 - a | 3 - c | 4 - b | 5 - a | 6 - a | 7 - a | 8 - a | 9 - d | 10 – b |
| 11 – c | 12 - b | 13 - a | 14 – c | 15 – a | 16 – a | 17 – b | 18 – c | 19 – d | 20 – a |
| 21 - d | 22 - b | 23 - a | 24 – a | 25 – d | 26 – b | 27 – b | 28 – d | 29 – a | 30 – c |
| 31 – c | 32 - c | 33 - b | 34 – a | 35 – b | 36 – c | 37 – b | 38 – b | 39 – c | 40 – a |
| 41 - a | 42 - b | 43 - c | 44 – c | 45 – a | 46 – a | 47 – a | 48 – c | 49 – c | 50 – a |

**Additional Examples**

1. C:\Users\tsuser.PC\Desktop\final.pngIf 1 + cos2= 3 sincos, then the integral value of cotis (0 <<)   
   a) 1 b) 2 c) 0 d) 3
2. C:\Users\tsuser.PC\Desktop\final.pngThe value of the following is 3 (sin4+ cos4) + 2 (sin6 + cos6) + 12 sin2cos22a) 2 b) 5 c) 3 d) 0
3. C:\Users\tsuser.PC\Desktop\final.pngThe value of the following is cos24 + cos55 + cos125 + cos204 + cos 300   
   a) 2 b) c) 1 d) -
4. C:\Users\tsuser.PC\Desktop\final.pngIf = 2 , then the value of sinis a) b) c) d)
5. C:\Users\tsuser.PC\Desktop\final.pngIf tan A + cotA = 2, then the value of tan10A + cot10 A is   
   a) 1 b) 4 c) 210 d) 2
6. C:\Users\tsuser.PC\Desktop\final.pngThe value of x { sin( + 46 ) + tan ( + 16)} for   
   a) – 1 b) 0 c) d) 1
7. C:\Users\tsuser.PC\Desktop\final.pngIf x = , then is equal to   
   a) x -1 b) c) d)
8. C:\Users\tsuser.PC\Desktop\final.pngIf sin = x2 – 2x + 2 , then the value of x is   
   a) 0 b) 1 c) -1 d) None of these
9. C:\Users\tsuser.PC\Desktop\final.pngThe value of + - 8 cos2 60 is   
   a) 0 b) 1 c) 2 d) -1
10. Find the minimum Value of Sec2 + sin2. Sin25 + cot2 + Cos2 +Tan2   
    a) 0 b) 4 c) 2 d) 3
11. C:\Users\tsuser.PC\Desktop\final.pngIf 0 , 2ycos = x sin and 2 x sec - ycosec = 3, then the value of x2 + 4y2 is   
    a) 1 b) 2 c) 3 d) 4
12. C:\Users\tsuser.PC\Desktop\final.pngIf + = 1, then the value of + is   
    a) 4 b) 0 c) d) 1
13. The value of [] (sec2A – cosec2A) is -

a) 1 b) 3 c) 2 d) 4

1. C:\Users\tsuser.PC\Desktop\final.pngThe eliminate of from xcos - ysin = 2 and x sin + y cos = 4 will give   
   a) x2 + y2 = 20 b) 3x2 +y2 = 20 c) x2- y2 = 20 d) 3x2 – y2 = 0
2. C:\Users\tsuser.PC\Desktop\final.pngIf cosec = , find the value of = ?   
   a) 3 b) 5 c) 7 d) 9
3. The value of sin – cos – cot . Sec + is equal to   
   a) 0 b) 4 c) 2 d)

1. C:\Users\tsuser.PC\Desktop\final.pngFind maximum and minimum values of 11cos2 x + 3sin2 x + 6sinx. Cosx   
   a) (0,7) b) (-1,17) c) (3,17) d) (7,17)
2. If u*n* = cosn sinn , then the value of 2u6 – 3u4 + 1 is   
   a) 4 b) 6 c) 0 d) 1
3. C:\Users\tsuser.PC\Desktop\final.pngIf sin21 = , then sec21 - sin69 is equal to   
   a) b) c) d)
4. C:\Users\tsuser.PC\Desktop\final.pngIf sec + tan = 2, then the value of sin is (assume that 0 < 90)   
   a) 0.4 b) 0.5 c) 0.6 d) 0.8

**Answers**

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 1 - a | 2 - b | 3 - b | 4 - c | 5 - d | 6 - d | 7 - b | 8 - b | 9 - a | 10 – b |
| 11 – d | 12 - d | 13 - c | 14 – a | 15 – a | 16 – a | 17 – d | 18 – c | 19 – a | 20 – c |