1. Cos q = 1-t^2 / 1+t^2 = 2 cos^2 ½ q -1
   Cos^2 ½ q = 1 / 1+t^2 --> cos q/2 = 1 / V(1+t^2) (B)
2. Cos x = V5 /5 = 1/V5
   Cos x positif berada di kuadran I dan IV
   Ctg (phi/2 – x) = tg x = +- 2/1 = +- 2 (B)
3. Sudut C = 90^o
   Cos (A+C) = k
   Cos (A+C) = cos (90^o + A)
   = - sin A
   = k
   Maka:
   Sin A = -k
   A+B = 90^o
   Cos B = cos (90^o – A)
   = sin A
   Sin A + cos B = sin A + sin A
   = 2 sin A
   = -2k (D)
4. Cos (a-b) = ½ V3
   Cos a . cos b = ½
   2 cos a cos b = 1
   Cos (a+b) + cos (a+b) = 1
   Cos (a+b) = 1 – cos(a-b)
   Cos(a+b)/cos(a-b) = 1- cos(a-b)/cos(a-b)
   = 2/3 V3 - 1 (A)
5. 2 cos [x+phi/4] = 2cos x cos phi/4 – 2 sin x sin phi/4
   = ½ V2 (cos x + sin x)…….(i)
   Cos [x+phi/4] = cos x . cos phi/4 . sin x . sin phi/4
   = ½ V2 (cos x + sin x)…….(ii)
   Dari persamaan (i) = (ii) didapat :
   V2 (cos x – sin x) = ½ V2 (cos x + sinx)
   Sehingga :
   Tg 2x = 2 tg x / 1 – tg^2 x = 3/4 (C)
6. Cos 4x – 3 sin 2x + 4 = 0
   Cos (2x + 2x) – 3 sin 2x + 4 = 0
   1 - 2 sin^2 2x – 3 sin 2x + 4 = 0
   2 sin^2 2x + 3 sin 2x – 5 = 0
   (2 sin 2x + 5)(sin 2x – 1) = 0
   2 sin 2x + 5 = 0 –> sin 2x = -5/2
   (tak mungkin -1 <= sin a <= 1)
   Sin 2x – 1 = 0
   Sin 2x = 1
   2x = phi/2
   X = ¼ phi (A)
7. Misal:
   V3 cos x – sin x = k cos (x-a)
   Untuk 0 <= x <= phi/2
   Dimana k = V(a^2+b^2)

= V(V3)^2 + V(-1)^2
= 2

Maka:

Tg alpha = b/a = -1/V3 (dikuadran IV)

a = -phi/6 sehingga :

V3 cos x – sin x = 2 cos (x + phi/6) (A)

8. Sin $(2x + 110)^o$ + sin $(2x – 10)^o$ = ½

   2 sin $(2x + 5)^o$ cos 60^o = ½

   2 sin (2x+ 5) = ½

   (1) 2x + 50 = 30 + k . 360
   2x = -20 + k . 360
   X = -10 + k . 180
   X = 170, 350

   (2) 2x + 50 = 150 + k .360
   2x = 100 + k . 360
   X = 50, 230

   HP = {50, 170, 230 , 350}

9. Cos 40^o + cos 80^o + cos 160^o
   = 2 cos 60^o cos 20^o + cos 160^o
   = cos 20^o + cos 160^o
   = 2 cos 90^o . cos 70^o
   = 2 . 0 . cos 70
   = 0 (C)

10. Cos alpha = 36 + 64 – 16 / 2. 8 . 6
    = 21/24 (B)

11. 2 sin^2 x + 5 sin x – 3 = 0
    (2 sin x – 1) (sin x + 3) = 0
    Sin x = ½ , cos x = ½ V3 (C)

12. 2 cos x – 2V3 sin x = k cos (x – alpha)
    K = V(4+12) = 4
    Alpha = arc tg -2V3 / 2 ,
    Alpha = 300^o
    2 cos x – 2V3 sin x = 4 cos $(x-300^o)$ (C)

13. Missal : sudut BAD = alpha
    Sudut BCD = beta
    Maka alpha + beta = 180^o
    = 108^o – alpha
    Aturan consinus pada segitiga BAD
    BD^2 = AB^2 + AD^2 – 2AB . AD cos alpha
    = 1 + 16 – 2 .1 . 4 cos alpha
    = 17 – 8 cos a (1)
    Aturan consinus pada segitiga BCD
    BD^2 = BC^2 + CD^2 – 2BC.CD cos beta
    = 4+9 – 2.2.3 cos (180-a)
    = 13 + 12 cos a (2)
    (1)&(2) : 17 – 8 cos a = 13 + 12 cos alpha
    4 = 2 cos alpha
    Cos a = 1/5 (C)

14. Sin 105^o cos 15^o + 2 cos 75^o sin 45^o
    = ½ sin 120^o + ½ sin 90^o + sin 120^o – sin 30^o
    = ½ . ½ V3 + 1/2 . 1 + ½ . V3 – ½ = ¾ V3 (D)
15. Sin $(3x – 20)^o$ + cos $(x+10)^o$ = sin$(3x-20)^o$ + sin$(80-x)^o$
    = 2 sin ½ (3x – 20 + 80 – x)^o cos ½ (3x – 20 – 80 + x)^o
    = 2 sin $(x+30)^o$. cos $(2x-50)^o$ (C)
16. Grafik tersebut adalah grafik dari y = 2 sin x digeser ke kiri sejauh phi/2 , sehingga persamaan menjadi : y = 2 sin (x+phi/2) (C)
17. 2 sin x cos x – V3 cos 2x – 1 = sin 2x – V3 cos 2x -1 = 0
    2 cos (2x-150)^o = 1
    Cos $(2x-150)^o$ = ½
    Cos $(2x-150)^o$ = cos 60^o
    (i) $2x – 150^o = 60^o + n. 360^o$
    $X = 105^o + n – 180^o$
    $X = 105^o , 295^o$
    (ii) $2x – 150 = -60^o + n. 360^o$
    $X = 45^o + N . 180^o$
    $X = 45^o , 225^o$ (D)
18. Cos 465^o – cos 165^o = - 2 sin 315^o . sin 150^o
    = -2 – ½ V2 .1/2
    = ½ V2 (A)
19. Dengan aturan cosinus
    BC^2 = 10^2 + 6^2 – 2.10.6 cos 60
    = 136 – 60
    = 2 V19 (A)
20. Segitga 1
    Cos A = 3/5
    Sin A = 4/5
    Segitiga 2
    Sin B = 12/13
    Cos B = -5/13 (negative Karena tumpul)
    Cos (A-B) = cos A cos B + sin A . sin B
    = 3/5 . -5/13 + 4/5 . 12/13 = 33/65 (C)
21. Bentuk umum grafik pada soal
    y = a sin n(x+alpha)^o , -alpha : pergeseran 60^o ke kanan, a = 2 , periode 2phi/n = 180
    y = 2 sin 2 $(x+60)^o$ → n = 2
    y = 2 sin $(2x-120)^o$ (C)
22. Cos alpha + cos beta = 2 cos (alpha + beta / 2) cos (alpha – beta) / 2)
    Cos $(2x + 30)^o$ + cos $(2x-30)^o$ < ½ V3
    2 cos 2x cos 30^o < ½ V3
    2 cos 2x . 1/2 V3 < ½ V3
    Cos 2x < ½
    $60^o < 2x < 300^o$ atau $420^o < 2x < 660^o$
    $30^o < x < 150^o$ atau $210^o < x < 330^o$ (B)
23. V3 cos x + sin x = V2 , 0 <= x < 2 phi
    Rumus : a cos x + b sin x = c
    K cos (x-alpha) = c ; k =V(a^2 + b^2)
    Alpha = atc tg b/c

K = V(3+1) alpha = arc tg 1/V3
= 2 = 30
2 cos (x-30^o) = V2
Cos (x-30^o) = ½ V2
x- 30^o = 45^o atau x – 30^o = 315^o
x = 75^o x = 345^o
= 5/12 phi x = 23/12 phi (D)

24. Sin 105^o – sin 15^o / cos 75^o – cos 15^o = 2 cos 60^o sin 45^o / -2 sin 45^o sin 30^o
= -1 (B)

25. Cos 75^o = cos (45^o +30^o)
= cos 45^o cos 30^o – sin 45^o sin 30^o
= ½ V2 . ½ V3 – ½ V2 . ½
= ¼ V6 – ¼ V2
= ¼ (V6 – V2) (B)

26. Sin alpha = 12/13 → cos alpha = 5/13
cos beta = -3/5 → sin beta = 4/5
sin tetta = sin (180 -(alpha+beta))
= sin (alpha + beta)
= sin alpha cos beta + sin beta cos alpha
= 12/13 . -3/5 + 4/5 . 5/13 → -36 + 20 / 65
= -16/ 65 (B)

27. Cos alpha cos beta = 48/45
Tan alpha – tan beta = 1/3
Sin alpha / cos alpha . sin beta / cos alpha cos beta = 1/3
Sin(alpha – beta) / cos alpha . cos beta = 1/3
Sin (alpha – beta) = 1/3 cos alpha cos beta
= 1/3 . 48/65
= 16/65 (C)

28. CT = x/V2 → AC = V(AT^2 + CT^2)
= V(9/2 x^2 + ½ x^2)
= xV5

Cos A = TA/AC = 3/2 x V2 / xV5 → cos A = 3/10 V10 (A)

29. Sin 2x + 2 cos x = 0 ; 0 <= x < 2phi
2 sin x cos x + 2 cos x = 0
Cos x = 0 atau sin x = -1
X = 90 , 270 x = 3phi/2
Himpunan penyelesain (phi/2 , 3phi/2) (D)

30. BC = CD = a
AD = a tg x
AB = V(2a)^2 + V(a^2tg^2 x)
= a V(4+tg^2 x)
Sin B = atg x / aV(4+tg^2 x)
= tgx / V(4+tg^2 x) (B)