1. 31
2. 80
3. 48
4. 0
5. 5

6. 33
7. 12
8. 10
9. $\pi / 2$
10. -24

11. 10,800
12. 13 / 12
13. -18
14. 16
15. 12

1.
Impossible scores:
1,2,4,5,8,11

$\Sigma = \boxed{31}$

2.
$\sin(\alpha + \beta) + \sin(\alpha - \beta)$
$= 2\sin\alpha\cos\beta$
$\Rightarrow \alpha = 30°, \beta = 10°$
$2\sin 30°\cos 10° = \cos 10°$
$= \sin 80°$
$\boxed{80}$

3.
A: (-2, 1)   B: (2,1)
C: (-6,-5)   B: (6,-5)

ABCD is a trapezoid.

Area = ½(4 + 12)(6) = $\boxed{48}$

4.
$\sum_{n=1}^{x} k = \dfrac{x(x+1)}{2}$

$\sum_{n=1}^{x} k^3 = \left[\dfrac{x(x+1)}{2}\right]^2$

$\sum_{n=1}^{x} k - \sqrt{\sum_{n=1}^{x} k^3} = \boxed{0}$

5.
$\tan 2\theta = \dfrac{2\tan\theta}{1 - \tan^2\theta} = \dfrac{12}{5}$

$\dfrac{\sin 2\theta}{1 + \cos 2\theta} = \dfrac{\tan 2\theta}{\sec 2\theta + 1}$

$\sec 2\theta = \sqrt{\tan^2 2\theta + 1} = 13/5$
$(12/5) / (13/5 + 1) = 2/3$
➔ $2 + 3 = \boxed{5}$

6.
A: 1 intersection (-3,0)
B: distance = 2c = 10
C: length = 4p = 16
D: area = πab = 6π

A + B + C + D/π = $\boxed{33}$

7.
A: $\Sigma = i - 1$
B: $\sqrt{8^2 + (-15)^2} = 17$
C: -(2)(4)/2 = -4
D: $1cis(-\pi/2) = -i$

A + B + C + D = $\boxed{12}$

8.
A = 0
B = $\lim_{x \to 3} \dfrac{(x-3)(x^2-1)}{(x-3)(2x-5)} = 8$
C = -2
D = 4

A + B + C + D = $\boxed{10}$

9. for $0 \le \theta \le 2\pi$
A = (π/4 , 5π/4)
B = (π/4 , π/2)+(π , 5π/4)
    +(3π/2 , 2π)
A∩B = (π/4 , π/2)
            + (π , 5π/4)
ℓ= (π/2 - π/4)+(5π4 - 5π/4)
  = π/4 + π/4 = $\boxed{π/2}$

10.
A = $5th\,term = 2^2\binom{6}{2} = 60$

B = (-3)(2)(1) = -6
C = 8!/3!
D = $\binom{8}{2} = \dfrac{8!}{2!6!}$
BC/AD = $\boxed{-24}$

11.
(60)(360) = 21,600
2π r = 21,600
r = A/π
2A = 21,600
A = $\boxed{10,800}$

12.
A = 1/6 + 1/6 − 36 = 11/36
B = 1/6 = 6/36
C = 15/36
D = 7/36

A + B + C + D = $\boxed{13/12}$

13. Multiplying by LCD leads to
the system of equations:
A + B = 3
4A + B +C = 5
4A - 2B − C =1
Solution (A,B,C) is (1,2,−1)
$\dfrac{9AB}{C} = \boxed{-18}$

14.
A = Area $= 4\sqrt{3}$
B = (2)(Area)/Perimeter $= \frac{2\sqrt{3}}{3}$
C = (4)(4)(4) / (4)(Area) $= \frac{4\sqrt{3}}{3}$
D = Area/(Perimeter/2) $= \frac{2\sqrt{3}}{3}$

$\dfrac{A \cdot B \cdot C}{D} = \boxed{16}$

15.
A = 15º, B = 90º
sin 105º = sin (60º + 45º)
sin60ºcos 45º+sin45ºcos60º
$= \dfrac{\sqrt{2} + \sqrt{6}}{4}$

➔ $2 + 4 + 6 = \boxed{12}$