

## Solutions for Meet 1

### Individual Questions

1. Draw and label a diagram with the segments intersecting at point O. Then we have  $m\angle BOD - m\angle AOC = 105 - 25 = 80$ .

2. We are given:  $\frac{100}{11} = 9^+$  and  $\frac{15,000}{11} = 1363^+$ . There are 33 squares from  $4^2$  to  $36^2$

3. We have  $a_1 = i + 1$ ,  $a_2 = i^2 + i + 1 = i$ ,  $a_3 = i^3 + i^2 + i = 1 = 0$ . Notice the pattern:  $a_{4n+1} = a_1$ ,  $a_{4n+2} = a_2$ ,  $a_{4n+3} = a_3$ . Now then,  $a_{27} = a_3 = 0$

4. We have  $\frac{\Delta s}{\Delta v} = \Delta t$ , or  $\frac{98 \text{ km}}{(99 - \frac{1}{99}) \text{ km/hr}} = \frac{98 \times 99 \text{ km}}{98 \times 100} = .99 \text{ hours}$

5.  $-(2 - (-2)^{-2})^2 = -\left[2 - \frac{1}{4}\right]^2 = \left(\frac{7}{4}\right)^2 = -\frac{49}{16}$

6. Sum:  $x^2 - y^2 - 2x - 6y - 8 = 0$  or  $(x - 1)^2 - (y + 3)^2 = 0$ , while we have difference:  $x^2 + y^2 - 2x + 6y - 5 = 0$  or  $(x - 1)^2 + (y + 3)^2 = 15$

Notice two circles with center  $(1, -3)$ . Transformation:  $x^2 - y^2 = 0$ , and  $x^2 + y^2 = 15$ .

So  $x = \pm y = \pm \frac{\sqrt{30}}{2}$  and the Area =  $4\left(\frac{\sqrt{30}}{2}\right)^2 = 30$