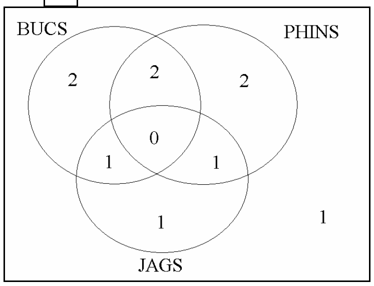
1. **27**



$A = 10, B = 5, C = 5, D = 7$

2. **12**

Possibilities include the following:

$\pm 6/1, \pm 6/2, \pm 3/1, \pm 3/2, \pm 2/1, \pm 2/2, \pm 1/1, \pm$

eliminating repetitions…

$\pm 6, \pm 3, \pm 2, \pm 3/2, \pm 1, \pm 1/2$

3. **1**

$A = \begin{vmatrix} 1 & 0 \\ 0 & 1 \end{vmatrix} = 1 - 0 = \underline{1}.$

$B = \begin{vmatrix} x & -\sqrt{1-x^2} \\ \sqrt{1-x^2} & x \end{vmatrix} = x^2 + (1 - x^2) = \underline{1}.$

$C = \begin{vmatrix} a & b \\ a & b \end{vmatrix} = ab - ab = \underline{0}.$

$D = \begin{vmatrix} \log 10^{-1} & 2^{\log 16} \\ \ln 1 & i^{2008} \end{vmatrix} = (-1)(1) - 0 = \underline{-1}.$

4. **504**

$\left.\begin{array}{l} 9a + 3b + c = 0 \\ c = 12 \\ a + b + c = 6 \end{array}\right\} \Rightarrow a = 1, b = -7$

roots of $y = x^2 - 7x + 12$ *are* $x = 3, 4.$

$\underline{A = 6}, \underline{B = 12}, \underline{C = 7}.$

5. **17**

A : (-3,-6)
B : (-1,10)
C : (-3,0)
D : (-1,-1)

The vertices form a trapezoid with bases = 6,11 and height = 2. → Area = $\underline{17}$.

6. **6**

$|x| = 5 - 2|x - 1|$

$\Rightarrow \begin{cases} x = 5 - 2(x - 2) \\ -x = 5 + 2(x - 2) \end{cases}$

$\Rightarrow \begin{cases} x = 3, y = 3 \\ x = -1/3, y = +1/3 \end{cases}$

$(a,b) = \underline{(3,3)}$ & $(c,d) = \underline{(-1/3,1/3)}$.

7. **19**

$A = -1(2)^{-2} = \underline{-1/4}.$

$B = 0(2)^{-1} = \underline{0}.$

$C = 1(2)^{0} = \underline{1}.$

$D = 2(2)^{1} = \underline{4}.$

$4(A + B + C + D) = 4(11/4) = 19.$

8. **64**

let $\log x = z \log 2$

$\rightarrow \; \rightarrow \frac{z}{8} - \frac{2}{z} = \frac{3}{4} \rightarrow \frac{z^2 - 16 = 6z}{8z}$

$\rightarrow z^2 - 6z - 16 = 0 \rightarrow z = 8, -2$

Thus z = -2,8.

Product of solutions = $2^8 2^{-2} = \underline{64}$

9. **5** $A = 1234_6 = 6^3 + 2(6^2) + 3(6^1) + 4(6^0) = 310_{10}$. $B = 12_{12} = 12^1 + 2 = 14_{10}$. $C = 31_8 = 3(8^1) + 1 = 25_{10}$. $D = 101.01_2 = 2^2 + 2^0 + 2^{-2} = 5.25_{10}$. $ABCD = (31^1)(7^2)(5^3)(3^1)$ **Note:** odd multiple of 5. Units digit = 5	10. **145** $A: (x-1)^2 + (y+8)^2 = 77$. → Area = 77π. $B: (x-2)^2 + (y-4)^2 = 20$. → Area = 20π. $C: \left(\frac{x-1}{3}\right)^2 + \left(\frac{y+5}{10}\right)^2 = 1$. → Area = 30π. $D: \left(\frac{x+1}{6}\right)^2 + \left(\frac{y+7}{3}\right)^2 = 1$. → Area = 18π.
11. **23** $A = \frac{x^3+x-21}{x-3} = x^2+3x+10+\frac{9}{x-3} \to 9$. $B = \frac{x^3+x-21}{x-3} = x+1+\frac{6}{x+4} \to 6$. $C = \frac{x^3+x-21}{x-3} = x^2+1+\frac{8}{x-2} \to 8$. $D = \frac{x^3+x-21}{x-3} = x+1+\frac{0}{x+1} \to 0$.	12. **63** $V \propto 1/p \Rightarrow p_1V_1 = p_2V_2$ $V_2 = V_1\left(\frac{p_1}{p_2}\right) = 56\left(\frac{18}{16}\right)$ $V_2 = 63 \text{ in}^3$
13. **-336** $A = \log_2(10\sqrt{2} - 8\sqrt{2}) = \log_2(2\sqrt{2}) = 3/2$ $B: \log_2(\log_3(\log_4 x)) = 0$ → $x = 4^3 = 64$ $C: (y-1)(y+3) = (y+2)^2$ $2y - 3 = 4y + 4$ → $y = -7/2$ $D = 9 = 12z - 3$ → $z = 1$. $ABCD = -336$	14. **30** $(0.2[10] + x) / (10 + x) = 0.8$ $0.2[10] + x = 0.8[10] + 0.8x$ $0.2x = 0.6[10]$ $x = 30$ liters
15. **3** $xy = 0.5\,([x^2 + y^2] - [x - y]^2)$ $= 0.5\,(15 - 3^2) = 3$.	