

1. 195
2. 1080, Use difference of squares
3. 10 degrees, $(30^\circ \text{ between } 7 \text{ and } 8) - (20^\circ \text{ that the hour hand travels in between})$
4. $\frac{4}{17}$, 12 possible out of 51 that you can draw on the second draw
5. 24, Say the distance between each is 60 miles. $\frac{120}{3+2}$ is 12 (total distance over total time)
6. 68, Average of the two bases is 4 and height is 17.
7. 8, $(2^3)(2^3)$ is the prime factorization so number of factors is $(4)(2)$
8. 15, $(({}^6C_2)({}^4C_2)({}^2C_2))/3!$ (since $3!$ ways to order how you choose them)
9. 54, $\frac{n(n-3)}{2}$ is the formula
10. 2, Multiply the first equation by 3 to get $3a=6$ (since they must be the same equation), $a=2$.
11. 13, $(y+2)^2=13(x+1)$
12. 36π , $4\pi r^2 = 36\pi$ $r=3$ so the volume is $\frac{4}{3}\pi r^3 = 36\pi$
13. 2, negation of x-coefficient divided by constant term
14. 12, $S_5 - S_4 = 42 - 30 = 12$
15. 17, y's cancel out leaving $x=17$
16. $4\sqrt{2}$ Octahedron is like two square pyramids stacked so use Pythagorean, then double.
17. 64, use Fermat's Little Theorem
18. 6, $S = \frac{\frac{3}{2}}{1 - \frac{3}{4}} = 6$
19. 10
20. $\frac{5}{36}$, (2,6)(3,5)(4,4) are the only possibilities so sum the probabilities for each (for the first two it can be in any order so it's $\frac{2}{36}$ but for (4,4) it's $\frac{1}{36}$)
21. 12, (3,4,5,6,7,8) and (-3,-4,-5,-6,-7,-8)
22. 25, Convert all the units to get $90000/3600=25$.
23. 5.29
24. 65, $2^{12}-1=(2^6-1)n$. $n=2^6+1$ because of difference of squares
25. 6, Count number of 5's
26. 20, $10+10$
27. 18, $7+11$
28. $\frac{49}{24}$, convert to denominator of 24.
29. 9, $4x+5=41$
30. -6, plug in $\frac{-b}{2a} = 1$ to get -6
31. 18, $1+2+9+6$
32. $\frac{6}{7}$
33. 0, If a is a root then -a is a root because it's even function, so all the roots cancel out
34. 1024, Plug in 1
35. 80, $(3+i)(3-i)=10$, $(4+3i)(1+i)=1+7i$
36. 4, $18 \times \frac{1}{3} \times \frac{2}{3}$
37. 90, $11^2, 12^2, \dots, 100^2$

38. 17, $9+8=17$

39. $14\sqrt{7}$, $5\sqrt{7} + 2\sqrt{7} + 3\sqrt{7} + 4\sqrt{7}$

40. $-\frac{3}{4}$, negative reciprocal of slope between (0,0) and (3,4)