7. The second leg of the right triangle measures $\sqrt{\left(8\sqrt{5}\right)^2 - \left(4\sqrt{11}\right)^2} = \sqrt{320 - 176} = \sqrt{144} = 12$.

If the diagonal of the square is 12, then its side measures $6\sqrt{2}$ and its area is 72.

Answer: 72

8. 11^1 ends in 11; 11^2 ends in 21; 11^3 ends in 31; 11^4 ends in 41; 11^5 ends in 51; 11^6 ends in 61; 11^7 ends in 71; 11^8 ends in 81; 11^9 ends in 91; 11^{10} ends in 01. The pattern continues and is cyclic over every 10 consecutive positive integral powers of 11. Therefore, 11^{57} ends in 71.
Every integral power of 5 greater than or equal to 2 ends in 25.

Answer: 46

9. By the factor or remainder theorem, f(-2) = 16 – 8a + 28 – 2b + 12 = 0; 8a + 2b = 56; 4a + b = 28.
Also, f(3) = 81 + 27a + 63 + 3b + 12 = 0; 27a + 3b = -156; 9a + b = -52. Subtracting (4a + b = 28) from (9a + b) = -52) yields 5a = -80, a = -16 and b = 92.

Answer: 108

10. Let x = # of hours they worked together.
Then, $\dfrac{x}{9} + \left(\dfrac{x}{9} + \dfrac{2x}{15}\right) + \dfrac{2}{15} \cdot \dfrac{3}{2} = 1$; Multiplying by 45 yields 5x + 5x + 6x + 9 = 45; x = 2.25

Answer: 2.25

11. Let S = the indicated sum. Then, nS = $A + \dfrac{A}{n} + \dfrac{A}{n^2} + \cdots$. nS – S = S(n – 1) = A.

Answer: $\dfrac{A}{n-1}$

12. The ratio 5:9 is equivalent to $\dfrac{8}{14.4}$. Therefore, triangles ABD and BDC are similar. Let CD = x.
Then, $\dfrac{5}{8} = \dfrac{8}{x}$ and x = 12.8

Answer: 12.8