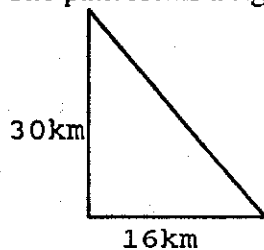


- C 1. The LCM of $3^2b^2c^1d^4$ and $2^13^1b^3c^5d^2$ will be each base with the highest exponent. Therefore, $\text{LCM} = 2^13^2b^3c^5d^4$, or simply $18b^3c^5d^4$.
- C 2. Midpoint will be $((10+6)/2, (3+5)/2)$, or $(8, 4)$. $8 + 4 = 12$.
- A 3. Definition.
- B 4. $i = i, i^2 = -1, i^3 = -i, i^4 = 1, i^5 = i, i^6 = -1$, etc. Repeats every 4. $\text{Remainder}(42/4) = 2$. $i^{42} = i^2 = -1$.
- A 5. $f(4(3)-10) = f(2) = 4(2) - 10 = -2$.
- D 6. Number of subsets in set of x elements is 2^x . When $x=3$, $2^x = 8$. If $\Phi = 8$, $2\Phi = 16$.
- B 7. $k/4 = 12$. So $4 \cdot (k/4) = 4 \cdot 12$. Simplified, $k = 48$. $2(48-3) = 90$.
- C 8. $(90^\circ - (180^\circ - 132^\circ)) = (90^\circ - 48^\circ) = 42^\circ$.
- D 9. $sn = 5q - 5m$. Divide both sides by s to receive $n = (5q - 5m)/s$.
- A 10. $\text{Dist.} = \sqrt{((-3 - 5)^2 + (2-17)^2)} = \sqrt{((-8)^2 + (-15)^2)} = \sqrt{(64 + 225)} = \sqrt{289} = 17$.
- B 11. $\text{Work} = \text{Rate} \cdot \text{Time}$. $\text{Rate} = 1/t$, $\text{Time} = u$. Product is u/t .
- D 12. $6 \cdot \sqrt{25} \cdot \sqrt{2} + 3 \cdot \sqrt{64} \cdot \sqrt{2} + -4 \cdot \sqrt{36} \cdot \sqrt{2} + 2 \cdot \sqrt{2} \cdot 2 = 6 \cdot 5\sqrt{2} + 3 \cdot 8\sqrt{2} + -4 \cdot 6\sqrt{2} + 4\sqrt{2}$
 $= 30\sqrt{2} + 24\sqrt{2} - 24\sqrt{2} + 4\sqrt{2} = (30+24-24+4)\sqrt{2} = 34\sqrt{2}$.
- B 13. $3^2r = 3^3$. $2r = 3$ and $r = 3/2$.
- C 14. $M = kH^3$. $9 = k(3^3)$. $k = 1/3$. $M = (1/3)H^3$. $243 = (1/3)H^3$. $H^3 = 729$, $H = 9$.
- E 15. The path forms a right triangle, as shown below.



The third leg is the hypotenuse. $c^2 = 16^2 + 30^2 = 256 + 900 = 1156$. $c = 34$. Total Distance = $16 + 30 + 34 = 80$.

- E 16. Factor: $(3x-4)(x+3) = 0$. $x = 4/3$ or $x = -3$.

B 17. Two points: (3,0) and (5,8). slope = $(0-8)/(3-5) = -8/(-2) = 4$. $y = 4x + b$.
Substitute the point (3,0). $0 = 4(3) + b$, $b = -12$. Equation is $y = 4x - 12$.

B 18. Synthetic Division (use $x = 2$ and the coefficients 1, -2, 3, 0, -2, 20)

$$\begin{array}{r|rrrrrr} 2 & 1 & -2 & 3 & 0 & -2 & 20 \\ & & 2 & 0 & 6 & 12 & 20 \\ \hline & 1 & 0 & 3 & 6 & 10 & 40 \end{array}$$

D 19. Factor out common expressions: $(3\beta + 4)^3(3\beta + 4 - 1) = 0$. Simplify to:
 $3(3\beta + 4)^3(\beta + 1) = 0$. Either $3\beta + 4 = 0$ or $\beta + 1 = 0$. $\beta = -4/3, -1$. $\alpha = -2 \frac{1}{3}$.

A 20. Percent/Base = Rate/100. Percent = 60, Base = 300, Rate = Q. $60/300 = Q/100$.
Cross-multiply to receive $6000 = 300Q$ or $Q = 20$.

D 21. $(a+b)(a-b) = a^2 - b^2$. $(4\sqrt{k})^2 - 3^2 = 39$. $16k - 9 = 39$. $16k = 48$. $k = 3$.

$$\begin{array}{r} D 22. \quad 3(2x + 3y = 23) \quad 6x + 9y = 69 \\ \quad -2(3x + 2y = 22) \quad + \quad -6x + -4y = -44 \\ \hline \quad \quad \quad \quad \quad \quad \quad 5y = 25 \quad y = 5 \Rightarrow x = 4. \quad \quad \quad \underline{4 + 5 = 9} \end{array}$$

$$\begin{array}{l} D 23. \quad 3h + 5 \leq 4 \quad \text{and} \quad 3h + 5 \geq -4 \\ \quad \quad 3h \leq -1 \quad \text{and} \quad 3h \geq -9 \\ \quad \quad h \leq -1/3 \quad \text{and} \quad h \geq -3 \quad \quad \quad -3 \leq h \leq -1/3 \end{array}$$

B 24. $w = 10 - j$. $(10 - j) + k = 7$. $k = -3 + j$. $j + (-3 + j) = 11$; $2j = 14$; so $j = 7$.
 $\Rightarrow w = 3, k = 4$ $3 + 2(7) - 3(4) = 5$.

C 25. $b+d = 15$ and $b-d = 3$. Add equations: $2b = 18$. $b = 9 \Rightarrow d = 6$. $4(9) - 3(6) = 18$.

D 26. I. Every element in the domain corresponds to one element in the range. True.
II. The domain is 3, 6, 9 (the abscissas). False.
III. The function has no restrictions on x-values. True.
IV. $x^2 > 0$ so $x^2 + 1 > 1$. False.

A 27. $7x + 28 - 3x + 70 - 5x + x^2 = -6 + 3x + x^2 + 7x - 6 \Rightarrow x^2 - x + 98 = x^2 + 10x - 12$.
 $110 = 11x$ so $x = 10$.

C 28. The first fraction cancels to 1, the second to -1, the third to -2. $1 + -1 - -2 = 2$.

C 29. $(16x^4 - 9y^6)(16x^4 + 9y^6)$ The first expression in parentheses will factor further.
 $(4x^2 - 3y^3)(4x^2 + 3y^3)(16x^4 + 9y^6)$.

B 30. $6 \cdot 5 \cdot 4 \cdot 3 \cdot 2 \cdot 1 / (3 \cdot 2 \cdot 1 \cdot 2 \cdot 1) = 720 / 60 = 60$.