1) I, II, IV **D**
2) $24 = 2^3 \cdot 3$,
LCM = $2^4 \cdot 3^2 = 16 \cdot 9 = 144$ **C**
3) $x + x + 2 + x + 4 = 81$; $3x = 75 \Rightarrow x = 25$ The integers are 25, 27, and 29, so the sum of the 2nd and 3rd is 56 **B**
4) Points are (3, 0) and (0, -2), so slope = ⅔. Equation is $y = \frac{2}{3}x - 2$: **B**
5) let f = # fiction ,and let f +24 = # nonfiction
$f + 24 + f = 336 \quad \Rightarrow f = 156$ Fiction is $^{156}/_{336}$ of collection, or $^{13}/_{28}$: **B**
6) $2x - 3 = 7$ *or* $2x - 3 = -7 \quad \Rightarrow x = 5$ *or* -2 The sum is 3: **B**
7) $x = \pm 5; y = \pm 3$ Least value of $y - x$ = -3-5 = -8 **E**
8) $2x - 4 - 3x + 9 = \frac{1}{2}x - \frac{3}{4} - \frac{1}{2}x - \frac{3}{4}$; So $x = {}^{13}/_{2}$; and $4x - 17 = 9$ **B**
9) $5x + 3x + 4x = 156$; $x = 13$, orange = $4x$= 52 **C**
10) **D**
11) The GCF of 192 and 160 is 32, so $32x^3y^2z^7$ **C**
12) $x + y = 31$ *and* $x - y = 19$. Adding gives us $2x = 50$, so $x = 25, y = 6$. The product is 150 **A**
13) $py - xy = mx; \Rightarrow py = mx + xy \Rightarrow py = x(m + y)$, so $x = \dfrac{py}{m + y}$ **A**
14) slope = $\dfrac{5-4}{3-1} = \dfrac{1}{2}$. So $\dfrac{6-4}{x-1} = \dfrac{1}{2} \Rightarrow x - 1 = 4,$ *so* $x = 5$ **D**
15) $(4x^2 - 25) - (x^2 - 4) - (9x^2 - 16) - (25x^2 - 49) = 19x^2 - 54$; **B**
16) $f(0) = 6; f(-1) = 8, f(2) = 2, f(3) = 0$, so the range is {0, 2, 6, 8} **B**
17) Using order of operations, we get 5 + $^{13}/_{3}$ – 4 + 12 which = $^{52}/_{3}$ **D**
18) Cross multiply and get $4x + 20 = -5x + 15$, so $x = {}^{-5}/_{9}$ **E**
19) Just simplify the powers of x: $\dfrac{x^{10}}{x^{12}} \div \dfrac{x^{-10}}{x^{12}} = x^{20}$. **C**
20) Distributing gives $x^4 + 2x^3 - 3x^2 - 3x^3 - 6x^2 + 9x + 2x^2 + 4x - 6$ which = $x^4 - x^3 - 7x^2 + 13x - 6$ **A**
21) Solving each part gives us $x > 5$ *or* $x \le -2$; -2 lies in this solution set; **A**
22) Change the second equation to slope-intercept form; the equations are identical; the lines coincide, so **D**
23) $\dfrac{10x+10}{(2x-1)(x-3)} - \dfrac{8(2x-1)}{(x-3)(2x-1)} = \dfrac{10x+10-16x+8}{(2x-1)(x-3)} = \dfrac{-6x+18}{(2x-1)(x-3)} = \dfrac{-6(x-3)}{(2x-1)(x-3)} = \dfrac{-6}{2x-1}$ **C**
24) $(9x+4)(8x-3)$, so A + B + C + D = 18 **C**
25) Let x = longer piece. $x + \frac{2}{3}x = 27$, so $x = 16^1/_5$. The shorter piece is ⅔ of that, or $10\ ^4/_5$. **B**
26) $\dfrac{-2}{3} = \dfrac{k - -3}{5-(k+2)}$; *so* $\dfrac{-2}{3} = \dfrac{k+3}{3-k}$. Cross multiply: $3k + 9 = -6 + 2k \Rightarrow k = -15$ **A**
27) Convert both to common base of 9: $9^{3x-2} = 9^{2x+2}$; set exponents equal and solve. $x = 4$ **B**
28) L has y-intercept 1, slope of ⅔, so slope of M is $-^3/_2$. The equation is $y = -^3/_2x + 1$, or $3x + 2y = 2$ **D**
29) $5p + 3e = 705$ and $3p + 2e = 430$; solving gives p = 120 and e = 35, so $4p + 4e$ = $6.20 **B**
30) Combine like terms and watch your signs! $x^2 + 9x - 10$ **B**