Algebra KEY:

① $x = 2y + 2$
$2x + 3y = 11$

$2(2y+2) + 3y = 11$
$4y + 4 + 3y = 11$
$7y + 4 = 11$
$-4 \quad -4$
$\frac{7y}{7} = \frac{7}{7}$
$y = 1$
$x = 4$
$(4, 1)$

② $2(x + 2y = -7)$
$3x - 4y = -1$
$2x + 4y = -14$

$\frac{5x}{5} = \frac{-15}{5}$
$x = -3$
$-3 + 2y = -7$
$+3 \quad +3$
$\frac{2y}{2} = \frac{-4}{2}$
$y = -2$
$(-3, -2)$

④ n = # of nickels
q = # of quarters
$-5(n + q = 25)$
$5n + 25q = 385$
$-5n - 5q = -125$

$\frac{20q}{20} = \frac{300}{20}$
$q = 13$
$n = 12$
12 nickels
13 quarters

③ $-x + 2y = -2$
$y = \frac{1}{2}x + 3$

$-x + 2(\frac{1}{2}x + 3) = -2$
$-x + x + 6 = -2$
$6 = -2$
no solution

⑤ x = # of 4pt questions
y = # of 5pt questions
$-4(x + y = 24)$
$4x + 5y = 100$
$-4x - 4y = -96$

$y = 4$
$x = 20$
20 4pt questions
4 5pt questions

⑥ x = price of balloon pack
y = price of favors pack
$2(3x + 4y = 14.63)$
$-3(2x + 5y = 16.03)$

$6x + 8y = 29.26$
$-6x - 15y = -48.09$

$\frac{-7y}{-7} = \frac{-18.83}{-7}$
$y = 2.69$

$3x + 4(2.69) = 14.63$
$3x + 10.76 = 14.63$
$-10.76 \quad -10.76$
$\frac{3x}{3} = \frac{3.87}{3}$
$x = 1.29$
A package of balloons costs $1.29

⑦ $x^4 \cdot x^{-4} = x^0 = 1$

⑧ $(5x^2y^{-2})^{-3}$
$5^{-3}x^{-6}y^6 = \frac{y^6}{5^3x^6}$
$= \frac{y^6}{125x^6}$

⑨ $(4x^{-3}y)^3$
$64x^{-9}y^3 = \frac{64y^3}{x^9}$

⑨ $\frac{15x^7y^3}{3x^4y^{-5}}$
$5x^3y^8$

⑩ Model: $y = 1200(0.91)^x$
$y = 1200(0.91)^5 \approx \$748.84$

⑪ $y = 1800(1.04)^{12}$
$y \approx \$2881.26$

⑫ $(-3x^2 + 4x^5 + 1) + (10x^5 - 7 - 9x^2)$
$14x^5 - 12x^2 - 6$

⑬ $(-2x^4 + 6x) - (3x - 8 + 5x^4)$
$-3x + 8 - 5x^4$
$-7x^4 + 3x + 8$

⑭ $-5y^2(y^8 + 3y^4 - 8y)$
$-5y^{10} - 15y^6 + 40y^3$

⑮ $(2x + 3)(7x - 5)$
$14x^2 - 10x + 21x - 15$
$14x^2 + 11x - 15$

(16) $(3x-4)(3x-4)$

$9x^2-12x-12x+16$

$9x^2-24x+16$

(17) $3x^2-21x+36$

$3(x^2-7x+12)$

$3(x-3)(x-4)$

(18) $6x^2-13x-5$

$(3x+1)(2x-5)$

(19) x^3-25x

$x(x^2-25)$

$x(x+5)(x-5)$

(20)

X	Y
-2	$\frac{1}{16}$
-1	$\frac{1}{4}$
0	1
1	4
2	16

(×4 between each pair)

Exponential - common ratio of 4

(21)

X	Y
0	5
1	7
2	9
3	11
4	13

Linear common difference of 2

(22)

X	Y	
-2	-8	+6
-1	-2	+2, -4
0	0	-2, -4
1	-2	-6, -4
2	-8	

Quadratic common second difference of -4

(23) $(3-\sqrt{5})(2+\sqrt{5})$

$6+3\sqrt{5}-2\sqrt{5}-\sqrt{25}$

$6+1\sqrt{5}-5$

$1+\sqrt{5}$

(24) $\sqrt{15}(2\sqrt{3}+\sqrt{2})$

$2\sqrt{45}+\sqrt{30}$

$2\sqrt{9}\sqrt{5}+\sqrt{30}$

$2\cdot 3\sqrt{5}+\sqrt{30}$

$6\sqrt{5}+\sqrt{30}$

(25) $-2\sqrt{20x}\cdot\sqrt{5x^3}$

$-2\sqrt{100x^4}$

$-2\cdot 10x^2$

$-20x^2$

(26) $2\sqrt{7}-8\sqrt{5}-11\sqrt{7}$

$-9\sqrt{7}-8\sqrt{5}$