7. V: $(-2,5)$ Pt: $(0,9)$

$h\ k$ $x\ y$

Vertex form $y = a(x-h)^2+k$

missing

plug in all info: $9 = a(0+2)^2+5$

solve for a: $9 = a(2)^2+5$

$9 = a\cdot(4)+5$

$4 = a\cdot(4)$

$1 = a$

Vertex form w/ a,h,k plugged in: $\boxed{y = 1(x+2)^2+5}$

12. $x^2-2x+3 \overline{)\ x^4+0x^3+3x^2+0x+1}$

$x^2+2x+4+\frac{2x-11}{x^2-2x+3}$

$-x^4+2x^3-3x^2$

$2x^3+0x^2+0x+1$

$-2x^3+4x^2-6x$

$4x^2-6x+1$

$-4x^2+8x-12$

$2x-11$

13. $x-3 \overline{)\ 3x^2-3x-5}$

$3x+6+\frac{13}{x-3}$

$-3x^2+9x$

$6x-5$

$-6x+18$

13

8. $C(x) = 10000 - 110x + .45x^2$

Minimum = Vertex

$h = \frac{-b}{2a} = \frac{+110}{2(.45)} = \frac{110}{.9}$ = 122.22 units (123 rounded) to produced Min. cost.

14.

2	9	-18	-16	32
	↓	18	0	-32
	9	0	-16	0

$9x^2+0x-16 \Rightarrow \boxed{9x^2-16}$

9. $f(x) = 2x^5+24x^4-10x^2+5x-3$

positive, odd → Left: $-\infty$ (down), Right: ∞ (up)

15.

2	5	3	-4	-4	4	6
	↓	10	26	44	80	168
	5	13	22	40	84	174

$\boxed{5x^4+13x^3+22x^2+40x+84+\frac{174}{x-2}}$

10. $f(x) = 2x^8-12x^7+3x^4+5x^3+2x+4$

positive, even → Left: ∞ (up), Right: ∞ (up)

16. Find one zero from Graphing

11. $f(x) = x^3-4x^2+4x$ (zeros = x-int, #'s that make equation zero)

$0 = x^3-4x^2+4x$

$0 = x(x^2-4x+4)$

$0 = x(x-2)(x-2)$

$x=0 \quad x=2 \quad x=2$

zeros: 0, 2 (mult. of 2)