① $y = 5.6^x$ $\quad 5.6 > 1$ growth

② $y = \frac{3}{4} \cdot (\frac{2}{3})^x$ $\quad 2/3 < 1$ decay

③ $y = (\frac{9}{2})^x$ $\quad \frac{9}{2} = 4.5 > 1$ growth

Function	initial value (a)	Factor (b)	rate (r)
④ $y = 78(1.02)^t$	78	1.02	.02 or 2%
⑤ $y = 56(.87)^t$	56	.87	.13 or 13%
⑥ $y = 4^x$	1	4	3 or 300%
⑦ $y = 65(1.35)^t$	65	1.35	.35 or 35%

Growth: $y = \underset{\text{initial value}}{a}\underbrace{(1+r)}_{\text{FACTOR}}{}^t$ $\qquad$ Decay: $y = \underset{\text{initial value}}{a}\underbrace{(1-r)}_{\text{Factor}}{}^t$

⑧ $y = 95000(1+.04)^t$

$y = 95000(1.04)^{18} = \$192{,}452.57$

⑨ $y = 9000(1-.025)^t$

$y = 9000(.975)^{30} = 4211$ people

⑩ $y = 11(1+.14)^t$

$y = 11(1.14)^6 = 24$ students

⑪ $y = 21500(1-.11)^t$

$y = 21500(.89)^7 = \$9509.74$

⑫ $y = 750000(1-.05)^t$

$y = 750000(.95)^7 = \$523,752.97$

⑬ $y = 50(1+.16)^t$

$y = 50(1.16)^7 = 141$ otters

Half-life $A = P(\frac{1}{2})^{t/\text{period}}$

⑭ $y = 200(\frac{1}{2})^{t/12}$

$y = 200(\frac{1}{2})^{84/12} = 1.5625$ grams

⑮ $y = 500(\frac{1}{2})^{t/80}$

$y = 500(\frac{1}{2})^{480/80} =$ 7.8125 grams

Compound Interest

$$A = P(1+\frac{r}{n})^{nt}$$

⑯ $P = 12000$

$r = .08$

$n = 12$

$t = 9$

$A = 12000(1+\frac{.08}{12})^{(12\cdot 9)}$

$A = \$24594.36$

⑰ $P = 23000$

$r = .06$

$n = 4$

$t = 11$

$A = 23000(1+\frac{.06}{4})^{(4\cdot 11)}$

$A = \$44282.66$

⑱ $P = 5500$

$r = .13$

$n = 2$

$t = 50$

$A = 5500(1+\frac{.13}{2})^{100}$

$A = 2,987,606.99$

19) $2^{6x+18} = 8^{5x}$

$2^{6x+18} = (2^3)^{5x}$

$2^{6x+18} = 2^{15x}$

$6x + 18 = 15x$

$18 = 9x$

$\boxed{x = 2}$

20) $3^{12x} = 3^{2x+75}$

$12x = 2x + 75$

$10x = 75$

$\boxed{x = 7.5}$

21) $5^{2x+5} = 125$

$5^{2x+5} = 5^3$

$2x + 5 = 3$

$2x = -2$

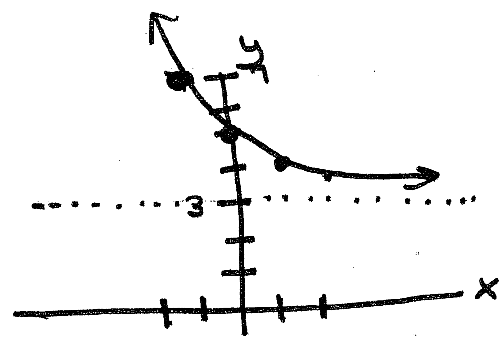
$\boxed{x = -1}$

22) $y = 2^x$ $\quad y = 6 \cdot 2^x - 3$

23) $y = 2^x$ $\quad y = 2^{(x-4)} + 9$

24) $y = 2^x$ $\quad y = -2^{(x+2)} + 7$

25) $y = 2(\frac{1}{2})^x + 3$ $\quad$ Sketch:



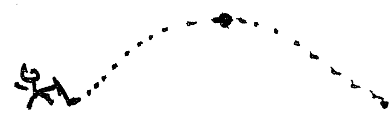
asymptote: $\boxed{y = 3}$

26) as $x \to -\infty$ $\boxed{y \to +\infty}$

as $x \to +\infty$, $\boxed{y \to 3}$

27) Range: $\boxed{y > 3}$

(28.) $h(t) = -16t^2 + 65t$

Find maximum. * Find vertex. 

Vertex: $x = \frac{-b}{2a} = \frac{-65}{-32} = \underline{2.03125}$

↳ plug in for t

$h(t) = -16t^2 + 65t$

$-16(2.03125)^2 + 65(2.03125) =$ $\boxed{66.0 \text{ ft high}}$

(29) $h(t) = -16t^2 + 65t$

how long until it hits ground?

Q.F. $x = \frac{-b \pm \sqrt{b^2-4ac}}{2a} = \frac{-65 \pm \sqrt{65^2-4(-16)(}}{-32}$

$= \frac{-65-65}{-32} = 4.0625$

$\boxed{4.1 \text{ seconds}}$

(30) $y = -(x-9)^2 + 2$

vertex: $(9, 2)$

AOS: $x = 9$

Range: $y \leq 2$