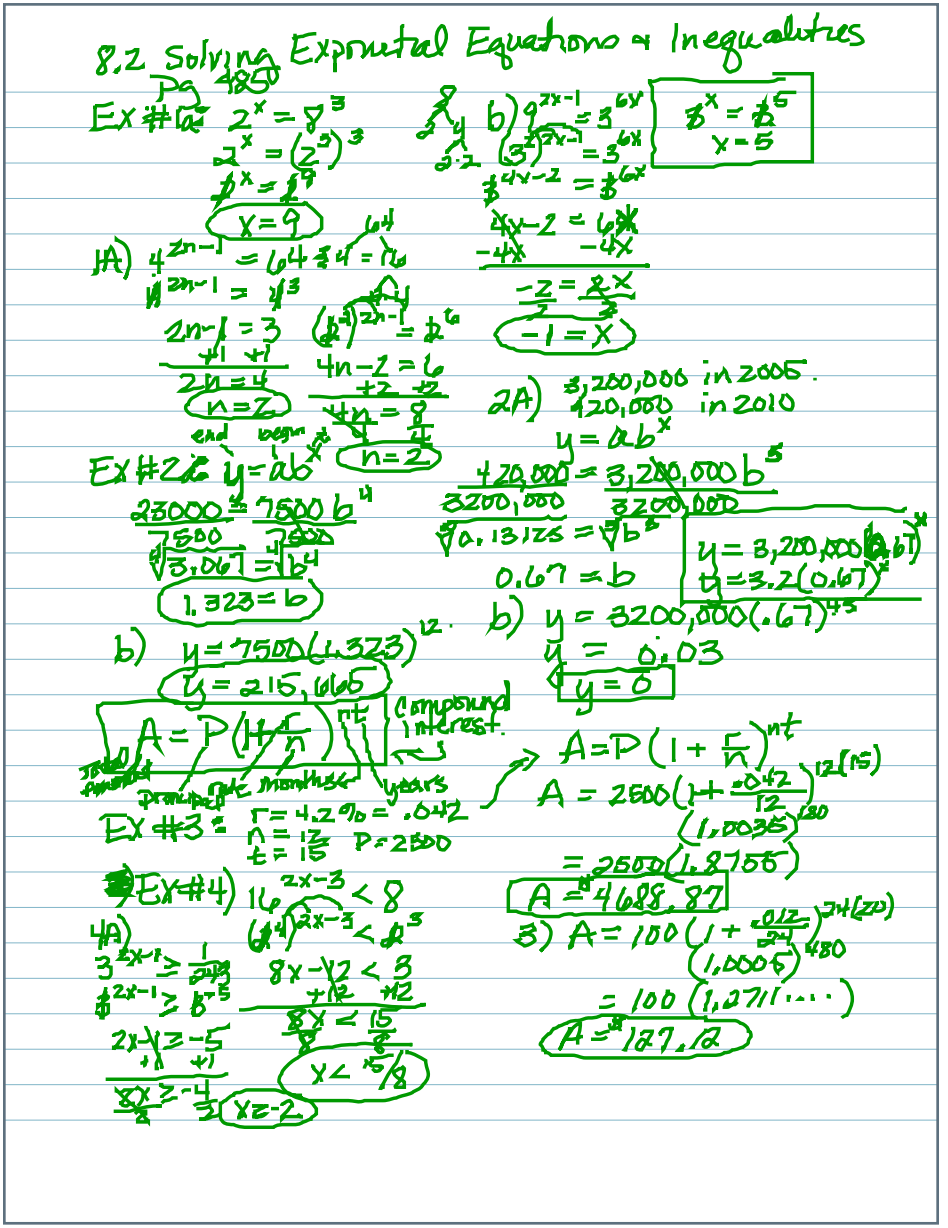

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8.2 Solving Exponential Equations & Inequalities

Pg 485

Ex #1a: $2^x = 8^3$

$2^x = (2^3)^3$

$2^x = 2^9$

$x = 9$

1A) $4^{2n-1} = 64$ (64 = 4 · 16)

$4^{2n-1} = 4^3$

$2n - 1 = 3$

$+1 \quad +1$

$2n = 4$

$n = 2$

$(4^1)^{2n-1} = 4^6$

$4n - 2 = 6$

$+2 \quad +2$

$4n = 8$

$n = 2$

Ex #2a: $y = ab^x$ (end, begin, t)

$\frac{23000}{7500} = \frac{7500\,b^4}{7500}$

$\sqrt[4]{3.067} = \sqrt[4]{b^4}$

$1.323 = b$

b) $y = 7500(1.323)^{12}$

$y = 215,666$

$A = P\left(1 + \frac{r}{n}\right)^{nt}$ — Compound Interest.

(Total Amount, principal, rate, months, years)

Ex #3: $r = 4.2\% = .042$, $n = 12$, $t = 15$, $P = 2500$

Ex #4) $16^{2x-3} < 8$

$(4^2)^{2x-3} < 4^3$

$8x - 12 < 3$

$+12 \quad +12$

$\frac{8x}{8} < \frac{15}{8}$

$x < 15/8$

4A) $3^{2x-1} \geq \frac{1}{243}$

$3^{2x-1} \geq 3^{-5}$

$2x - 1 \geq -5$

$+1 \quad +1$

$\frac{2x}{2} \geq \frac{-4}{2}$

$x \geq -2$

b) $9^{2x-1} = 3^{6x}$

$(3^2)^{2x-1} = 3^{6x}$

$3^{4x-2} = 3^{6x}$

$4x - 2 = 6x$

$-4x \quad -4x$

$\frac{-2}{2} = \frac{2x}{2}$

$-1 = x$

$3^x = 3^5$

$x = 5$

2A) 3,200,000 in 2005.

420,000 in 2010

$y = ab^x$

$\frac{420,000}{3200,000} = \frac{3,200,000\,b^5}{3200,000}$

$\sqrt[5]{0.13125} = \sqrt[5]{b^5}$

$0.67 = b$

$y = 3,200,000(0.67)^x$

$y = 3.2(0.67)^x$

b) $y = 3200,000(.67)^{45}$

$y = 0.03$

$y = 0$

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

$A = 2500\left(1 + \frac{.042}{12}\right)^{12(15)}$

$\left(1.0035\right)^{180}$

$= 2500(1.8756)$

$A = \$4688.87$

3) $A = 100\left(1 + \frac{.012}{24}\right)^{24(20)}$

$\left(1.0005\right)^{480}$

$= 100(1.2711\ldots)$

$A = \$127.12$