

4.2b
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Exponential Functions are of the form

$$f(x) = b^x \text{ where } b > 0 \text{ and } b \neq 1$$

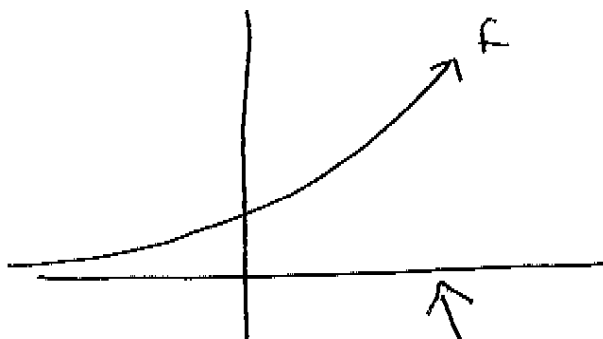
b is the base

x is the exponent.

$$b > 1$$

$$f(x) = 2^x$$

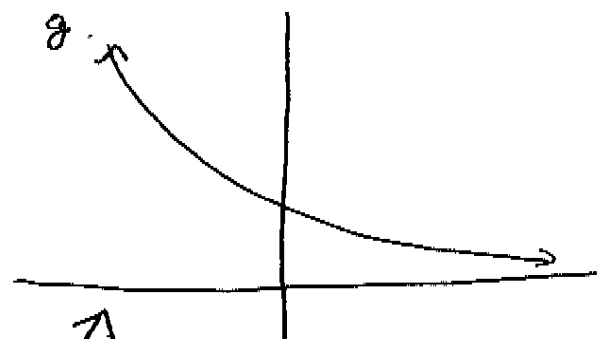
x	$f(x)$
-3	
-2	



$$0 < b < 1$$

$$g(x) = \left(\frac{1}{2}\right)^x$$

x	$g(x)$



asymptote

Domain \mathbb{R} Range.

Exponential Fcts are 1-1.

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write up exponent rules.

Ex 1: $5^{3x} = 25^{x+3}$

Ex 2: $4^{2x+2} = 8^{x+2}$

Ex 3: $100^{x^2} = 10^{5x-3}$

Applications:

Ex 4: Suppose we invest \$2000 in a 5 yr CD. at the current rate of 4%. ~~what~~ IF interest is compounded monthly, what is it worth at maturity?

Ex 5: Overhead: Average 30-Year Conventional Mortgage Rate

$$P(t) = P_0 \left(1 + \frac{r}{n}\right)^{nt}$$

Ex 6: Dusty & Char want to save for Melissa's college fund. How much should they invest today at a ~~8.25%~~ rather 4% compounded monthly to have \$40k in 17 yrs.

~~A~~ How about monthly contributions?

Ex 7: Find a formula for an initial pop of 5000 that

- doubles every 4 yrs.
- doubles in 4 mo.

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Ex 1: Euler's grand parents invest \$2000 on his birthday in an account that ~~pay~~ earns 8% interest compounded annually. How much was the account worth in 18 years?

$$P_1(18) = 2000 \left(1 + \frac{.08}{1}\right)^{1(18)}$$

$$P_4(18)$$

$$P_{12}(18)$$

$$P_{52}(18)$$

$$P_{365}(18)$$

$$P_{\infty}(18)$$

Ex 2: Invest \$1 at 100% for 1 year.

N	$1 \left(1 + \frac{1}{N}\right)^N$
1	
10	
100	
\vdots	

compare to e .

$$e \approx 2.718281828$$

$$e = \lim_{N \rightarrow \infty} \left(1 + \frac{1}{N}\right)^N$$

e is irrational - like π or $\sqrt{2}$.

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Ex 3: HCC costs about \$2000/yr to attend. How much should have been invested 15 yrs ago to pay for 2 yrs at HCC? Assume 10% annually, compounded continuously.

$$P(15) = P_0 e^{0.10(15)}$$

Ex 4: Effective Annual Yield.

Will an investment of \$10000 at 8.9% compounded cont. ever be worth \$10000 at 9% compounded quarterly?

Ex 5: Should Dusey break his rate lock?

GOOD FAITH ESTIMATE OF BORROWER'S SETTLEMENT COSTS

APPLICANT ("You", "Your") Charlene M Wilson Dustin W Wilson [REDACTED]	LENDER ("We") Boeing Employees' Credit Union 12770 Gateway Drive Tukwila, WA 98168
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Date of this Estimate **11/04/2002** Estimated Closing Date **11/19/02** Loan Officer **Web Application**
 Loan Program **FIX 30 Year Conv**
 Term **360** ; Rate **5.8750 %** Origination Fee **1.0000 %**; Discount Fee **-0.1250 %**
 Purchase Price / Value \$ [REDACTED] Loan Amount **\$ 159,900.00** Loan to Value [REDACTED]
 Property Address [REDACTED]

The information provided below reflects estimates of the charges which you are likely to incur at the settlement of your loan. The fees listed are estimates - the actual charges may be more or less. Your transaction may not involve a fee for every item listed.
 The numbers listed beside the estimates generally correspond to the numbered lines contained in the HUD-1 or HUD-1A settlement statement which you will be receiving at settlement. The HUD-1 or HUD-1A settlement statement will show you the actual cost for items paid at settlement.

800. ITEMS PAYABLE IN CONNECTION WITH LOAN:		1006.	\$	0.00
801. Loan Origination Fee	1.0000 % \$ 1,599.00	1007.	\$	0.00
802. Loan Discount Fee	-0.1250 % \$ -199.88	1008.	\$	0.00
803. Appraisal Fee	\$ 0.00	1100. TITLE CHARGES:		
804. Credit Report	\$ 0.00	1101. Settlement Fee	\$	465.00
805. Lender's Inspection Fee	\$ 0.00	1102. Abstract or Title Search	\$	0.00
806.	\$ 0.00	1103. Title Examination	\$	0.00
807. Assumption Fee	\$ 0.00	1104. Title Insurance Binder	\$	0.00
808.	\$ 0.00	1105. Document Preparation Fee	\$	0.00
809. Tax Registration	\$ 65.00	1106. Notary Fee	\$	0.00
810.	\$ 0.00	1107. Attorney's Fee	\$	0.00
811.	\$ 0.00	1108. Title Insurance	\$	415.00
812.	\$ 0.00	1111.	\$	0.00
813.	\$ 0.00	1112.	\$	0.00
814.	\$ 0.00	1113.	\$	0.00
815.	\$ 0.00	1200. GOVERNMENT RECORDING AND TRANSFER CHARGES:		
900. ITEMS REQUIRED BY LENDER TO BE PAID IN ADVANCE:		1201. Recording Fees	\$	90.00
901. Interest from 11/19/02		Deed \$; Mortgage \$;		
to 12/01/02 at \$ 25.74 /day	\$ 308.88	Release \$		
902. Mortgage Insurance Premium	\$ 0.00	1202. City / County Tax / Stamps	\$	0.00
903. Hazard Insurance Premium	\$ 450.00	Deed \$; Mortgage \$;		
904.	\$ 0.00	Release \$		
905. Application Fee to BECU 10/31/20	\$ 350.00	1203. State Tax / Stamps	\$	0.00
1000. RESERVES DEPOSITED WITH LENDER:		Deed \$; Mortgage \$		
1001. Hazard Insurance Premium	\$ 76.00	1204.	\$	0.00
2 months at \$ 38.00 /month		1205.	\$	0.00
1002. Mortgage Insurance	\$ 0.00	1300. ADDITIONAL SETTLEMENT CHARGES:		
months at \$ 62.63 /month		1301. Survey	\$	0.00
1003. City Property Taxes	\$ 0.00	1302. Pest Inspection	\$	0.00
months at \$ 0.00 /month		1303.	\$	0.00
1004. County Property Taxes	\$ 752.00	1304.	\$	0.00
4 months at \$ 188.00 /month		1305.	\$	0.00
1005. Annual Assessments	\$ 0.00	1400. TOTAL ESTIMATED SETTLEMENT CHARGES:	\$	4,021.01
months at \$ 0.00 /month				

EST. MONTHLY PMT.:	PPD. INT. & ESCROWS:	ANNUAL AMOUNT:	ANALYSIS OF ESTIMATED SETTLEMENT CHARGES:
P & I 945.87	Ppd. Interest 308.88	R.E. Taxes 2,256.00	1400. Total Estimated Settlement Charges: \$ 4,021.01
R.E. Taxes 188.00	R.E. Taxes 752.00	Hazard Ins. 456.00	Less: Prepaid Interest and Escrows \$ 1,136.88
Hazard Ins. 38.00	Hazard Ins. 76.00	Flood Ins. 0.00	= Other Estimated Settlement Charges: \$ 2,884.12
Flood Ins.	Flood Ins. 0.00	Mtg. Ins. 751.53	
Mtg. Ins. 62.63	Mtg. Ins. 0.00	Other 0.00	
Other 0.00	Other 0.00		
Total Pmt. 1,234.50	Total Ppds. 1,136.88		