Exponential and Logarithmic Functions

AP Precalculus · Vocabulary in context

Word	Example
sequence /'si:kwəns/	A **sequence** places its terms in a particular order.
arithmetic sequence /əˈrɪθmətɪk 'si:kwəns/	2, 7, 12, 17 is an **arithmetic sequence**. 2, 7, 12, 17
common difference /'kɒmən 'dɪfrəns/	In the sequence 3, 7, 11, 15, the **common difference** is 4. 3, 7, 11, 15 4
geometric sequence /ˌdʒi:əʊ'metrɪk 'si:kwəns/	2, 6, 18, 54 is a **geometric sequence**. 2, 6, 18, 54
common ratio /'kɒmən 'reɪʃɪəʊ/	In the sequence 2, 6, 18, 54, the **common ratio** is 3. 2, 6, 18, 54 3
explicit sequence rule	The **explicit sequence rule** $a_n = 2n$ gives any term at once. $a_n = 2n$
recursive sequence rule	The **recursive sequence rule** $a_n = a_{n-1} + 3$ builds each term from the last. $a_n = a_{n-1} + 3$
linear function /'lɪnɪə 'fʌŋkʃn/	$y = 2x + 1$ is a **linear function**. $y = 2x + 1$
domain /dəˈmeɪn/	Leave zero out of the **domain** when x is on the bottom of a fraction. x
exponential function /ˌekspəˈnenʃl 'fʌŋkʃn/	The **exponential function** e^x is its own derivative. e^x
initial value /ɪˈnɪʃl 'vælju:/	The **initial value** is the value when $x = 0$. $x = 0$
base /beɪs/	In $\log_2 8 = 3$, the **base** is 2. $\log_2 8 = 3$ 2

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exponential growth /ˌekspəˈnenʃl grəʊθ/	A population that doubles every year shows **exponential growth**.
exponential decay /ˌekspəˈnenʃl dɪˈkeɪ/	The charge falls by **exponential decay**.
root /ru:t/	3 is the cube **root** of 27. 3 27
baseline /'beɪslaɪn/	Subtract the **baseline** before looking at the change.
natural base /'nætʃərəl beɪs/	The **natural base** e is about 2.718. e 2.718
exponential regression /ˌekspəˈnenʃl rɪˈgreʃn/	**Exponential regression** fits a curve like $y = ab^x$ to data. $y = ab^x$
residual /rɪˈsɪdʒu:əl/	Subtract the predicted value from the real value to find the **residual**.
residual plot /rɪˈsɪdʒu:əl plɒt/	A **residual plot** with no pattern means a line fits well.
composite function /'kɒmpəzɪt 'fʌŋkʃn/	A **composite function** fg(x) means f(g(x)): apply g first. fg(x) f(g(x)) g
identity function /aɪˈdentɪti 'fʌŋkʃn/	The **identity function** $f(x) = x$ gives back what you put in. $f(x) = x$
decomposition /ˌdi:kɒmpəˈzɪʃn/	**Decomposition** breaks a big problem into small parts.
invertible /ɪnˈvɜ:tɪbl/	A function is **invertible** if each output comes from only one input.
inverse function /ɪnˈvɜ:s 'fʌŋkʃn/	The **inverse function** undoes the original function.

Word	Example
range /reɪndʒ/	The **range** of $f(x) = x^2$ is all values greater than or equal to zero. $f(x) = x^2$
logarithm /'lɒgərɪθəm/	Take the **logarithm** of both sides.
common logarithm /'kɒmən 'lɒgərɪθəm/	The **common logarithm** uses base 10. 10
natural logarithm /'nætʃərəl 'lɒgərɪθəm/	The **natural logarithm** ln x uses base e. ln x e
logarithmic scale /ˌlɒgə'rɪθmɪk skeɪl/	The Richter scale is a **logarithmic scale**.
logarithmic function /ˌlɒgə'rɪθmɪk 'fʌŋkʃn/	$y = \log x$ is a **logarithmic function**. $y = \log x$
change-of-base /tʃeɪndʒ ɒv beɪs/	The **change-of-base** rule writes $\log_2 8$ as $\log 8 \div \log 2$. $\log_2 8$ $\log 8 \div \log 2$
extraneous solutions	Check for **extraneous solutions**: some answers may not work.
logarithmic model /ˌlɒgə'rɪθmɪk 'mɒdl/	A **logarithmic model** grows quickly at first and then slowly.
parameters /pə'ræmɪtəz/	The procedure has two **parameters**: a name and an age.
logarithmic regression	**Logarithmic regression** fits $y = a + b \ln x$ to data. $y = a + b \ln x$
interpolation /ɪnˌtɜːpə'leɪʃn/	**Interpolation** estimates a value inside the range of the data.
extrapolation /ek'stræpəleɪʃn/	Predicting beyond the data is **extrapolation**.

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Word	Example
semi-log plot /'semi lɒg plɒt/	On a **semi-log plot**, exponential data form a straight line.
slope /sləʊp/	A steeper line has a larger **slope**.
intercept /ˌɪntə'sept/	The line crosses the y-axis at the **intercept**. y