

# Review

**Student Text Pages**

408 to 409

**Suggested Timing**

60–75 min

**Tools**

- graphing calculator

**Related Resources**

- BLM 7–10 Chapter 7 Review

## Study Guide

Use the following study guide to direct students who have difficulty with specific questions to appropriate examples to review.

| Question | Section(s) | Refer to                      |
|----------|------------|-------------------------------|
| 1        | 7.1        | Example 1 (page 365)          |
| 2        | 7.1        | Example 1 (page 365)          |
| 3        | 7.1        | Example 2 (pages 366–367)     |
| 4        | 7.2        | Example 1 (pages 370–371)     |
| 5        | 7.2        | Example 2 (pages 371–372)     |
| 6        | 7.2        | Example 2 (pages 371–372)     |
| 7        | 7.2        | Example 3 (pages 372–373)     |
| 8        | 7.2        | Example 1 (pages 370–371)     |
| 9        | 7.3        | Example 2 (page 381)          |
| 10       | 7.3        | Example 1 (pages 380–381)     |
| 11       | 7.3        | Example 3 (page 382)          |
| 12       | 7.3        | Example 4 (pages 382–383)     |
| 13       | 7.4        | Example 1 (page 388)          |
| 14       | 7.4        | Example 2 (pages 389–390)     |
| 15       | 7.4        | Investigate (page 387)        |
| 16       | 7.4        | Questions 8 and 10 (page 392) |
| 17       | 7.5        | Example 2 (pages 400–403)     |

# Problem Wrap-Up

## Student Text Page

409

## Suggested Timing

40–75 min

## Tools

- graphing calculator

## Related Resources

- BLM 7–11 Chapter 7 Problem Wrap-Up Rubric

## Summative Assessment

- Use BLM 7–11 Chapter 7 Problem Wrap-Up Rubric to assess student achievement.

## Using the Chapter Problem

Students will require graphing technology to complete this Chapter Problem. Encourage students to reflect on the work they did in exponential and logarithmic functions during the chapter, including mathematical modelling. Introduce and discuss the Chapter Problem Wrap-Up as a class. Describe and clarify the assessment criteria before students begin their work.

## Level 3 Sample Response

- a) A scatter plot for the given data was generated using a graphing calculator. To overcome an overflow error, the Year values were reduced by 2000.

| L1   | L2    | L3 | Z |
|------|-------|----|---|
| 2000 | 606   |    |   |
| 2001 | 718   |    |   |
| 2002 | 815   |    |   |
| 2003 | 956   |    |   |
| 2004 | 1092  |    |   |
| 2005 | 1220  |    |   |
| 2006 | 1320  |    |   |
| 2007 | 1420  |    |   |
| 2008 | 1520  |    |   |
| 2009 | 1620  |    |   |
| 2010 | 1720  |    |   |
| 2011 | 1820  |    |   |
| 2012 | 1920  |    |   |
| 2013 | 2020  |    |   |
| 2014 | 2120  |    |   |
| 2015 | 2220  |    |   |
| 2016 | 2320  |    |   |
| 2017 | 2420  |    |   |
| 2018 | 2520  |    |   |
| 2019 | 2620  |    |   |
| 2020 | 2720  |    |   |
| 2021 | 2820  |    |   |
| 2022 | 2920  |    |   |
| 2023 | 3020  |    |   |
| 2024 | 3120  |    |   |
| 2025 | 3220  |    |   |
| 2026 | 3320  |    |   |
| 2027 | 3420  |    |   |
| 2028 | 3520  |    |   |
| 2029 | 3620  |    |   |
| 2030 | 3720  |    |   |
| 2031 | 3820  |    |   |
| 2032 | 3920  |    |   |
| 2033 | 4020  |    |   |
| 2034 | 4120  |    |   |
| 2035 | 4220  |    |   |
| 2036 | 4320  |    |   |
| 2037 | 4420  |    |   |
| 2038 | 4520  |    |   |
| 2039 | 4620  |    |   |
| 2040 | 4720  |    |   |
| 2041 | 4820  |    |   |
| 2042 | 4920  |    |   |
| 2043 | 5020  |    |   |
| 2044 | 5120  |    |   |
| 2045 | 5220  |    |   |
| 2046 | 5320  |    |   |
| 2047 | 5420  |    |   |
| 2048 | 5520  |    |   |
| 2049 | 5620  |    |   |
| 2050 | 5720  |    |   |
| 2051 | 5820  |    |   |
| 2052 | 5920  |    |   |
| 2053 | 6020  |    |   |
| 2054 | 6120  |    |   |
| 2055 | 6220  |    |   |
| 2056 | 6320  |    |   |
| 2057 | 6420  |    |   |
| 2058 | 6520  |    |   |
| 2059 | 6620  |    |   |
| 2060 | 6720  |    |   |
| 2061 | 6820  |    |   |
| 2062 | 6920  |    |   |
| 2063 | 7020  |    |   |
| 2064 | 7120  |    |   |
| 2065 | 7220  |    |   |
| 2066 | 7320  |    |   |
| 2067 | 7420  |    |   |
| 2068 | 7520  |    |   |
| 2069 | 7620  |    |   |
| 2070 | 7720  |    |   |
| 2071 | 7820  |    |   |
| 2072 | 7920  |    |   |
| 2073 | 8020  |    |   |
| 2074 | 8120  |    |   |
| 2075 | 8220  |    |   |
| 2076 | 8320  |    |   |
| 2077 | 8420  |    |   |
| 2078 | 8520  |    |   |
| 2079 | 8620  |    |   |
| 2080 | 8720  |    |   |
| 2081 | 8820  |    |   |
| 2082 | 8920  |    |   |
| 2083 | 9020  |    |   |
| 2084 | 9120  |    |   |
| 2085 | 9220  |    |   |
| 2086 | 9320  |    |   |
| 2087 | 9420  |    |   |
| 2088 | 9520  |    |   |
| 2089 | 9620  |    |   |
| 2090 | 9720  |    |   |
| 2091 | 9820  |    |   |
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| 2093 | 10020 |    |   |
| 2094 | 10120 |    |   |
| 2095 | 10220 |    |   |
| 2096 | 10320 |    |   |
| 2097 | 10420 |    |   |
| 2098 | 10520 |    |   |
| 2099 | 10620 |    |   |
| 2100 | 10720 |    |   |
| 2101 | 10820 |    |   |
| 2102 | 10920 |    |   |
| 2103 | 11020 |    |   |
| 2104 | 11120 |    |   |
| 2105 | 11220 |    |   |
| 2106 | 11320 |    |   |
| 2107 | 11420 |    |   |
| 2108 | 11520 |    |   |
| 2109 | 11620 |    |   |
| 2110 | 11720 |    |   |
| 2111 | 11820 |    |   |
| 2112 | 11920 |    |   |
| 2113 | 12020 |    |   |
| 2114 | 12120 |    |   |
| 2115 | 12220 |    |   |
| 2116 | 12320 |    |   |
| 2117 | 12420 |    |   |
| 2118 | 12520 |    |   |
| 2119 | 12620 |    |   |
| 2120 | 12720 |    |   |
| 2121 | 12820 |    |   |
| 2122 | 12920 |    |   |
| 2123 | 13020 |    |   |
| 2124 | 13120 |    |   |
| 2125 | 13220 |    |   |
| 2126 | 13320 |    |   |
| 2127 | 13420 |    |   |
| 2128 | 13520 |    |   |
| 2129 | 13620 |    |   |
| 2130 | 13720 |    |   |
| 2131 | 13820 |    |   |
| 2132 | 13920 |    |   |
| 2133 | 14020 |    |   |
| 2134 | 14120 |    |   |
| 2135 | 14220 |    |   |
| 2136 | 14320 |    |   |
| 2137 | 14420 |    |   |
| 2138 | 14520 |    |   |
| 2139 | 14620 |    |   |
| 2140 | 14720 |    |   |
| 2141 | 14820 |    |   |
| 2142 | 14920 |    |   |
| 2143 | 15020 |    |   |
| 2144 | 15120 |    |   |
| 2145 | 15220 |    |   |
| 2146 | 15320 |    |   |
| 2147 | 15420 |    |   |
| 2148 | 15520 |    |   |
| 2149 | 15620 |    |   |
| 2150 | 15720 |    |   |
| 2151 | 15820 |    |   |
| 2152 | 15920 |    |   |
| 2153 | 16020 |    |   |
| 2154 | 16120 |    |   |
| 2155 | 16220 |    |   |
| 2156 | 16320 |    |   |
| 2157 | 16420 |    |   |
| 2158 | 16520 |    |   |
| 2159 | 16620 |    |   |
| 2160 | 16720 |    |   |
| 2161 | 16820 |    |   |
| 2162 | 16920 |    |   |
| 2163 | 17020 |    |   |
| 2164 | 17120 |    |   |
| 2165 | 17220 |    |   |
| 2166 | 17320 |    |   |
| 2167 | 17420 |    |   |
| 2168 | 17520 |    |   |
| 2169 | 17620 |    |   |
| 2170 | 17720 |    |   |
| 2171 | 17820 |    |   |
| 2172 | 17920 |    |   |
| 2173 | 18020 |    |   |
| 2174 | 18120 |    |   |
| 2175 | 18220 |    |   |
| 2176 | 18320 |    |   |
| 2177 | 18420 |    |   |
| 2178 | 18520 |    |   |
| 2179 | 18620 |    |   |
| 2180 | 18720 |    |   |
| 2181 | 18820 |    |   |
| 2182 | 18920 |    |   |
| 2183 | 19020 |    |   |
| 2184 | 19120 |    |   |
| 2185 | 19220 |    |   |
| 2186 | 19320 |    |   |
| 2187 | 19420 |    |   |
| 2188 | 19520 |    |   |
| 2189 | 19620 |    |   |
| 2190 | 19720 |    |   |
| 2191 | 19820 |    |   |
| 2192 | 19920 |    |   |
| 2193 | 20020 |    |   |
| 2194 | 20120 |    |   |
| 2195 | 20220 |    |   |
| 2196 | 20320 |    |   |
| 2197 | 20420 |    |   |
| 2198 | 20520 |    |   |
| 2199 | 20620 |    |   |
| 2200 | 20720 |    |   |
| 2201 | 20820 |    |   |
| 2202 | 20920 |    |   |
| 2203 | 21020 |    |   |
| 2204 | 21120 |    |   |
| 2205 | 21220 |    |   |
| 2206 | 21320 |    |   |
| 2207 | 21420 |    |   |
| 2208 | 21520 |    |   |
| 2209 | 21620 |    |   |
| 2210 | 21720 |    |   |
| 2211 | 21820 |    |   |
| 2212 | 21920 |    |   |
| 2213 | 22020 |    |   |
| 2214 | 22120 |    |   |
| 2215 | 22220 |    |   |
| 2216 | 22320 |    |   |
| 2217 | 22420 |    |   |
| 2218 | 22520 |    |   |
| 2219 | 22620 |    |   |
| 2220 | 22720 |    |   |
| 2221 | 22820 |    |   |
| 2222 | 22920 |    |   |
| 2223 | 23020 |    |   |
| 2224 | 23120 |    |   |
| 2225 | 23220 |    |   |
| 2226 | 23320 |    |   |
| 2227 | 23420 |    |   |
| 2228 | 23520 |    |   |
| 2229 | 23620 |    |   |
| 2230 | 23720 |    |   |
| 2231 | 23820 |    |   |
| 2232 | 23920 |    |   |
| 2233 | 24020 |    |   |
| 2234 | 24120 |    |   |
| 2235 | 24220 |    |   |
| 2236 | 24320 |    |   |
| 2237 | 24420 |    |   |
| 2238 | 24520 |    |   |
| 2239 | 24620 |    |   |
| 2240 | 24720 |    |   |
| 2241 | 24820 |    |   |
| 2242 | 24920 |    |   |
| 2243 | 25020 |    |   |
| 2244 | 25120 |    |   |
| 2245 | 25220 |    |   |
| 2246 | 25320 |    |   |
| 2247 | 25420 |    |   |
| 2248 | 25520 |    |   |
| 2249 | 25620 |    |   |
| 2250 | 25720 |    |   |
| 2251 | 25820 |    |   |
| 2252 | 25920 |    |   |
| 2253 | 26020 |    |   |
| 2254 | 26120 |    |   |
| 2255 | 26220 |    |   |
| 2256 | 26320 |    |   |
| 2257 | 26420 |    |   |
| 2258 | 26520 |    |   |
| 2259 | 26620 |    |   |
| 2260 | 26720 |    |   |
| 2261 | 26820 |    |   |
| 2262 | 26920 |    |   |
| 2263 | 27020 |    |   |
| 2264 | 27120 |    |   |
| 2265 | 27220 |    |   |
| 2266 | 27320 |    |   |
| 2267 | 27420 |    |   |
| 2268 | 27520 |    |   |
| 2269 | 27620 |    |   |
| 2270 | 27720 |    |   |
| 2271 | 27820 |    |   |
| 2272 | 27920 |    |   |
| 2273 | 28020 |    |   |
| 2274 | 28120 |    |   |
| 2275 | 28220 |    |   |
| 2276 | 28320 |    |   |
| 2277 | 28420 |    |   |
| 2278 | 28520 |    |   |
| 2279 | 28620 |    |   |
| 2280 | 28720 |    |   |
| 2281 | 28820 |    |   |
| 2282 | 28920 |    |   |
| 2283 | 29020 |    |   |
| 2284 | 29120 |    |   |
| 2285 | 29220 |    |   |
| 2286 | 29320 |    |   |
| 2287 | 29420 |    |   |
| 2288 | 29520 |    |   |
| 2289 | 29620 |    |   |
| 2290 | 29720 |    |   |
| 2291 | 29820 |    |   |
| 2292 | 29920 |    |   |
| 2293 | 30020 |    |   |
| 2294 | 30120 |    |   |
| 2295 | 30220 |    |   |
| 2296 | 30320 |    |   |
| 2297 | 30420 |    |   |
| 2298 | 30520 |    |   |
| 2299 | 30620 |    |   |
| 2300 | 30720 |    |   |
| 2301 | 30820 |    |   |
| 2302 | 30920 |    |   |
| 2303 | 31020 |    |   |
| 2304 | 31120 |    |   |
| 2305 | 31220 |    |   |
|      |       |    |   |

## Level 3 Notes

Look for:

- A mathematical model is determined using graphing technology that accurately fits the data
- All questions are answered with mathematically correct solutions, perhaps containing one or two minor errors or omissions
- The student communicates solutions with reasonable clarity
- Arguments are posed and supported with mathematical reasoning, including one or two reasonable responses to part e)

## What Distinguishes Level 2

- A mathematical model is determined using graphing technology that reasonably fits the data
- Most questions are answered with generally correct solutions, perhaps containing one or two major errors or omissions
- The student communicates solutions with some clarity, however there are one or two gaps or errors in thinking
- Arguments are posed, including one or two reasonable responses to part e), but are not supported or are weakly supported with mathematical reasoning

## What Distinguishes Level 4

- A mathematical model is determined using graphing technology that accurately fits the data, with justification of the model provided
- All questions are answered with mathematically correct solutions and clear explanations
- The student communicates solutions with a high degree of clarity, using more than one representation (e.g., algebra, graph, sentences)
- Arguments are posed and supported with mathematical reasoning, including several reasonable responses or one or two creative or insightful responses to part e)