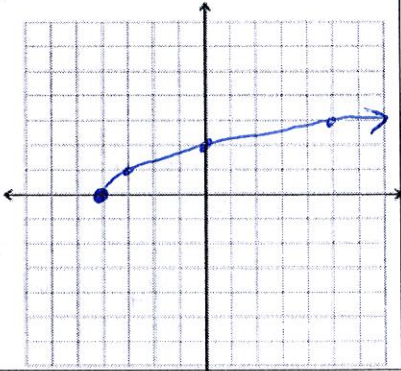
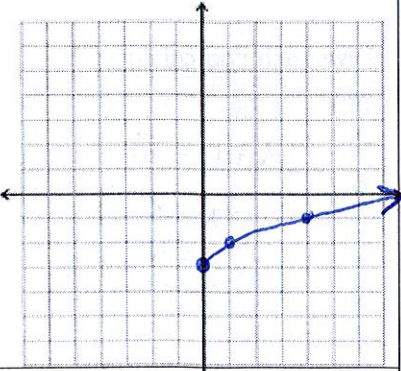
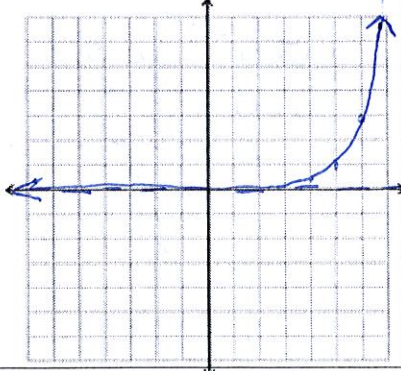
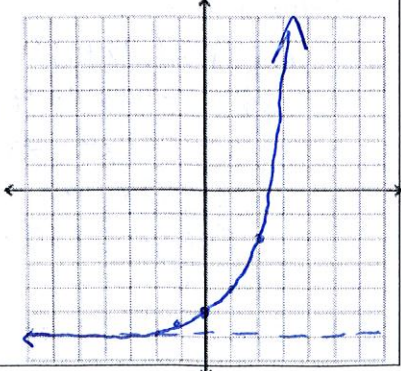


Answer each question. Show all work.

<p>1. If the world population is about 6 billion people now and if the population grows continuously at an annual rate of 1.7%, what will the population be in 10 years?</p> <p>$A = 6,000,000,000 e^{.017(10)}$ $A = 7,111,829,108$ about 7 billion</p>	<p>2. Find the amount of money you will have after 10 years if \$15,000 is invested in accounts paying 6% interest compounded:</p> <p>a. Annually = $15000(1+.06)^{10}$ d. Daily = $15000(1+\frac{.06}{365})^{365(10)}$ $\\$26,862.72$ $\\$27,330.43$</p> <p>b. Quarterly = $15000(1+\frac{.06}{4})^{4(10)}$ e. Continuously $\\$27,210.28$ $15000e^{.06(10)}$</p> <p>c. Monthly = $15000(1+\frac{.06}{12})^{12(10)}$ $\\$27,331.78$ $\\$27,290.95$</p>
<p>3. In 1996 the population of Russia was 148 million and the population of Nigeria was 104 million. If the populations of Russia and Nigeria grow continuously at annual rates of -0.62% and 3.0%, respectively, when will Nigeria have a greater population than Russia?</p> <p>$148000000 e^{-.0062t} = 104,000,000 e^{.03t} \rightarrow t = 9.75 \text{ yrs.}$</p>	<p>4. At what annual rate compounded continuously will \$1,000 have to be invested to amount to \$2,500 in 10 years?</p> <p>$2500 = 1000 e^{r(10)}$ Graph & find intersection $r = 9.2\%$</p>
<p>5. A promissory note will pay \$30,000 at maturity 10 years from now. How much should you be willing to pay for the note now if the note gains value at a rate of 9% compounded continuously?</p> <p>$30,000 = P e^{.09(10)}$ Graph & find intersection $P = \\$12,197.09$ window $x:(5009 5000)$ $y:(9.35000)$</p>	<p>6. As long as a plant or animal is alive, carbon 14 is maintained in a constant amount in its tissues. Once dead, however, the plant or animal ceases taking in carbon, and carbon 14 diminishes by radioactive decay. Estimate the age of a skull uncovered in an archaeological site if 10% of the original amount of carbon 14 is still present.</p> <p>$.10A_0 = A_0 e^{-.000124t}$ $\ln .10 = \ln e^{-.000124t}$ $\ln .10 = -.000124t$ $t = 18,569 \text{ years}$</p>

Graph each function.

<p>$f(x) = \sqrt{x+4} = 1\sqrt{x-(-4)} + 0$</p> <p>Parent function: $y = \sqrt{x}$</p> <p>Transformation: shift left 4</p> <p>Domain: $x \geq -4$ Range: $y \geq 0$</p> 	<p>$f(x) = \sqrt{x-3} = 1\sqrt{x-0} - 3$</p> <p>Parent function: $y = \sqrt{x}$</p> <p>Transformation: shift down 3</p> <p>Domain: $x \geq 0$ Range: $y \geq -3$</p> 																								
<table border="1" style="display: inline-table; margin-right: 10px;"> <tr><td>x</td><td>y</td></tr> <tr><td>3</td><td>1/3</td></tr> <tr><td>4</td><td>1/2</td></tr> <tr><td>5</td><td>2/3</td></tr> <tr><td>6</td><td>1/2</td></tr> <tr><td>7</td><td>2/3</td></tr> </table> <p>$g(x) = 3^{x-5} = 1 \cdot 3^{(x-5)} + 0$</p> <p>Parent function: $y = 3^x$</p> <p>Transformation: right 5 units</p> <p>Domain: \mathbb{R} Range: $y > 0$ asymptote $y = 0$</p> 	x	y	3	1/3	4	1/2	5	2/3	6	1/2	7	2/3	<table border="1" style="display: inline-table; margin-right: 10px;"> <tr><td>x</td><td>y</td></tr> <tr><td>-2</td><td>-5.75</td></tr> <tr><td>-1</td><td>-5.5</td></tr> <tr><td>0</td><td>-5</td></tr> <tr><td>1</td><td>-4.5</td></tr> <tr><td>2</td><td>-4</td></tr> </table> <p>$h(x) = 2^x - 6 = 1 \cdot 2^{(x-0)} - 6$</p> <p>Parent function: $y = 2^x$</p> <p>Transformation: down 6 units</p> <p>Domain: \mathbb{R} Range: $y > -6$ asymptote $y = -6$</p> 	x	y	-2	-5.75	-1	-5.5	0	-5	1	-4.5	2	-4
x	y																								
3	1/3																								
4	1/2																								
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6	1/2																								
7	2/3																								
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-2	-5.75																								
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0	-5																								
1	-4.5																								
2	-4																								

SIMPLIFY EACH EXPRESSION:

11) $\left(\frac{-4s^6}{t^3r^5}\right)^3 = \frac{-64s^{18}}{t^9r^{15}}$

12) $\left(\frac{-2d^{11}f^6}{c^{18}}\right)^2 = \frac{4d^{22}f^{12}}{c^{36}}$

13) $\left(\frac{2d^4}{4e}\right)^3 = \left(\frac{d^4}{2e}\right)^3 = \frac{d^{12}}{8e^3}$

14) $\frac{6r^3}{2r} = 3r^2$

14) $\frac{-40s^6}{20s^3} = -2s^3$

15) $\frac{21d^{18}e^5}{7d^{11}e^3} = 3d^7e^2$

16) $(11c^8)(-10c^4d) = -110c^{12}d$

17) $(9x^{10}z^2)(-x^5y^3) = -9x^{15}y^3z^2$

18) $(-8f^6g)(-7f^2g^5h) = 56f^8g^6h$

19) $\left(\frac{-24t^6}{8t^3}\right)^5 = (-3t^3)^5 = -243t^{15}$

20) $\left(\frac{d^{11}f^{16}}{d^6f^6}\right)^3 = (d^5f^{10})^3 = d^{15}f^{30}$

21) $\left(\frac{7d^2}{14d^4}\right)^5 = \left(\frac{1}{2d^2}\right)^5 = \frac{1}{32d^{10}}$

Solve each radical equation.

22) $\sqrt{2x+1} = 3$

$2x+1 = 9$

$2x = 8$

$x = 4 \checkmark$

23) $\sqrt{x+3} = 2x$

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

$x+3 = 4x^2$

$0 = 4x^2 - x - 3$

$x = -3/4 \text{ and } x = 1 \checkmark$

24) $\sqrt{6x+1} = 2x+1$

$6x+1 = (2x+1)^2$

$6x+1 = 4x^2+4x+1$

$0 = 4x^2-2x$

$0 = 2x(2x-1)$

$x = 0 \text{ and } x = 1/2 \checkmark$

25) $\sqrt{5x+1} + 5 = 3x$

$\sqrt{5x+1} = (3x-5)^2$

$5x+1 = 9x^2-30x+25$

$0 = 9x^2-35x+24$

$x = 8/9 \text{ and } x = 3 \checkmark$