___ 3. A model for the demand for an mp3 player is $d = -3p^2 + 270p - 40$ where d is the number of mp3 players a manufacturer can sell at a price of p dollars each. Find the price that results in the maximum demand for mp3 players.

a) $45 b) $6.67 c) $90 d) None of these

$-3p^2+270p-40$

$-3(p^2-90p\ \ )-40$

$\frac{-270}{2\cdot-3)}$ $\frac{270}{6}$

45

The table shows the population (in millions) of five countries in 2000 and the populations (in millions) for the year 2010.

Find the exponential growth or decay model $y = ae^{bt}$ or $y = ae^{-bt}$ for the population of each country by letting t = 0 correspond to 2000. Use the model to predict the population of each country in 2030.

$y = ae^{-bt}$

$7.1 = 7.8e^{-b(10)}$

$.9102 = e^{-10b}$

$\ln .9102 = \ln e^{-10b}$

$-.0941 = -10b$

$b = .009$

$34.3 = 31.3e^{10b}$

$1.0958 = e^{10b}$

$\ln(1.0958) = \ln e^{10b}$

$y = 7.8e^{-.009(30)}$

	Model	Pop. in 2030
Bulgaria	$y = 7.8e^{-.009t}$	5.9 million
Canada	$y = 31.3e^{.009t}$	41.2 million
China		
United King		
United States		

Country	2000	2010
Bulgaria	7.8	7.1
Canada	31.3	34.3
China	1268.9	1347.6
United Kingdom	59.5	61.2
United States	282.3	309.3

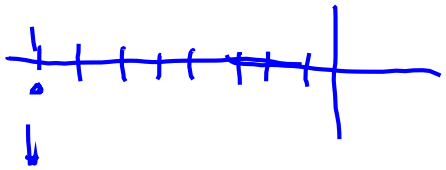
___ 4. In 2000, the average price of a downtown apartment in Lake County was $98,000. By 2007, the average price of a downtown apartment was $112,000. Which of the following is a linear model for the price P of a downtown apartment in Lake County, in terms of the year t? Let t = 0 correspond to 2000.

(0, 98,000) (7, 112,000) $\frac{112{,}000 - 98{,}000}{7 - 0}$

P = 2000t + 98,000

a) P = 2000t + 98,000 b) P = 14,000t + 98,000 c) P = 112,000 – 14,000t

d) P = 112,000 – 2000t



___ 5. Determine which set of ordered pairs (x, y) represents y as a function of x.

a) {(4, -2), (-8, -1), (-8, 4), (-1, -8)}

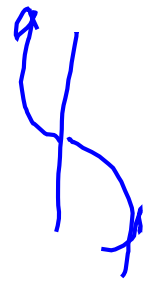
b) {(4, -2), (-2, -8), (4, -1)}

c) {(4, -2), (-2, 4), (-1, -1)}

d) {4, -2, -8, -1}

___ 7. Identify the right-hand and left-hand behavior of the graph of the polynomial function $f(x) = -6x^7 - 2x$ odd exponent

$y = -x + b$ $y = -ax^2$ — leading coeff sign



a) Falls to the left. Rises to the right.

b) Rises to the left. Falls to the right.

c) Rises to the left. Rises to the right.

d) Falls to the left. Falls to the right

23. If f(x) = 3x + 6 and g(x) = 3x + 6, find (f ° g)(-4).

$f(g(-4))$

a) -12 b) -11 c) -15 d) -14

$f \circ g = 3(3x+6)+6$

$9x+18+6$

$(f \circ g)(x) = 9x+24$

$f \circ g(-4) = 9(-4)+24$

-12

$3(-4)+6$

-6

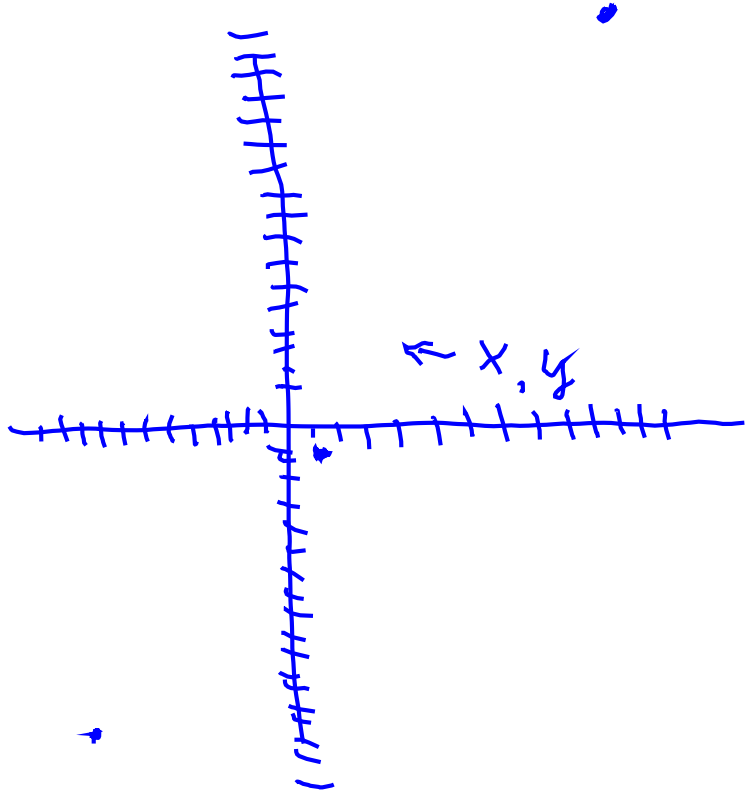
$3(-6)+6$

Find the midpoint of the line segment connecting (13, 17) and (-12, -18).

$\left(\frac{13+(-12)}{2}, \frac{17+(-18)}{2}\right)$

$\left(\frac{1}{2}, \frac{-1}{2}\right)$

a) (-1, 1) b) (25/2, 35/2) c) (1/2, -1/2) d) (1, -1)



. Find the inverse of the function f(x) = $2x + \frac{1}{3}$.

$y = 2x + \frac{1}{3}$

$x = 2y + \frac{1}{3}$

$x - \frac{1}{3} = 2y$

$\frac{1}{2}x - \frac{1}{6} = y$

$\frac{1}{3} \div 2$

$\frac{1}{3} \cdot \frac{1}{2}$

a) $f^{-1}(x) = \frac{2}{3}x - \frac{1}{2}$

b) $f^{-1}(x) = \frac{3}{2}x + \frac{1}{2}$

c) $f^{-1}(x) = \frac{1}{3}x + \frac{1}{6}$

d) $f^{-1}(x) = \frac{1}{2}x - \frac{1}{6}$

$f^{-1}(x) = \frac{1}{2}x - \frac{1}{6}$

___ 28. Determine the domain of the function $f(x) = \frac{6x}{x(x-9)}$.

$x(x-9) = 0$

$0, 9$

a) $(-\infty, -9)(-9,0)(0, 9)(9, \infty)$

b) $(-\infty, -3)(-3, 0)(0, 3)(3, \infty)$

c) $(-\infty, -3)(-3, 3)(3, \infty)$

d) $(-\infty, 0)(0 ,9)(9, \infty)$