Homework
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Quick quiz AP Practice
1-4

You may use a graphing calculator to solve the following problems.

1. Multiple Choice Which of the following gives an equation for the line through $(3, -1)$ and parallel to the line $y = -2x + 1$?

(A) $= \frac{1}{2}x + \frac{7}{2}$ **(B)** $y = \frac{1}{2}x - \frac{5}{2}$ **(C)** $y = -2x + 5$

(D) $y = -2x - 7$ **(E)** $y = -2x + 1$

2. Multiple Choice If $f(x) = x^2 + 1$ and $g(x) = 2x - 1$, which of the following gives $f \circ g(2)$?

(A) 2 **(B)** 5 **(C)** 9 **(D)** 10 **(E)** 15

① $m = -2$

$y = -2(x-3) - 1$

$y = -2x + 5$

② $f(g(2)) = f(2(2)-1) = f(3) = 3^2 + 1 = 10$

3. Multiple Choice The half-life of a certain radioactive substance is 8 hr. There are 5 grams present initially. Which of the following gives the best approximation when there will be 1 gram remaining?

(A) 2 **(B)** 10 **(C)** 15 **(D)** 16 **(E)** 19

4. Free Response Let $f(x) = e^{-x} - 2$.

(a) Find the domain of f. **(b)** Find the range of f.

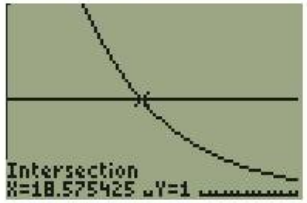
(c) Find the zeros of f.

(3)

$A = P_0\left(\frac{1}{2}\right)^{n/8}$

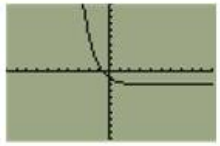
$A(n) = 5\left(\frac{1}{2}\right)^{n/8}$

$1 = 5\left(\frac{1}{2}\right)^{n/8}$



(4)

e^{-x} e^{x}



e^{-x}

a) $\mathbb{R}$

b) $(-2, \infty)$

c) $-\ln 2$

$e^{-x} - 2 = 0$

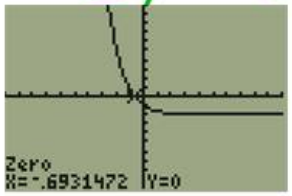
$e^{-x} = 2$

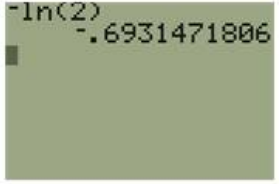
$\frac{1}{e^x} = 2$; $\frac{1}{2} = e^x$

$x = \ln 1/2$

$x = \ln 1 - \ln 2$

$x = -\ln 2$





You may use a graphing calculator to solve the following problems.

41. **True or False** The number 3^{-2} is negative. Justify your answer.

42. **True or False** If $4^3 = 2^a$, then $a = 6$. Justify your answer.

43. **Multiple Choice** John invests \$200 at 4.5% compounded annually. About how long will it take for John's investment to double in value?

(A) 6 yr (B) 9 yr (C) 12 yr (D) 16 yr (E) 20 yr

44. **Multiple Choice** Which of the following gives the domain of $y = 2e^{-x} - 3$?

(A) $(-\infty, \infty)$ (B) $[-3, \infty)$ (C) $[-1, \infty)$ (D) $(-\infty, 3]$

(E) $x \neq 0$

False $3^{-2} = \frac{1}{3^2} = \frac{1}{9}$

true

$4^3 = (2^2)^3 = 2^6 = 2^a$

$\therefore a = 6$

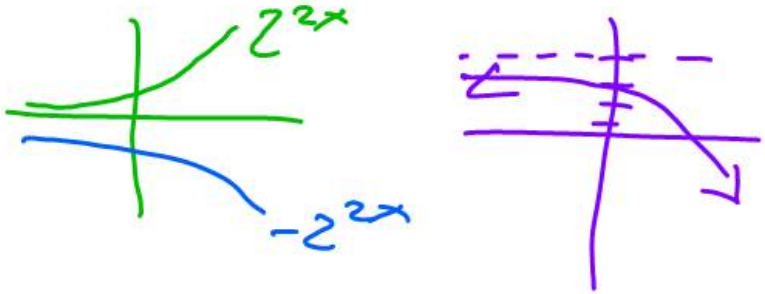
43

$400 = 200(1.045)^t$

$2 = 1.045^t$

$t = \frac{\ln 2}{\ln 1.045}$

ln(2)/ln(1.045)
15.74730184



45. Multiple Choice Which of the following gives the range of $y = 4 - 2^{2x}$?

(A) $(-\infty, \infty)$ **(B)** $(-\infty, 4)$ **(C)** $[-4, \infty)$

(D) $(-\infty, 4]$ **(E)** all reals

46. Multiple Choice Which of the following gives the best approximation for the zero of $f(x) = 4 - e^x$?

(A) $x = -1.386$ **(B)** $x = 0.386$ **(C)** $x = 1.386$

(D) $x = 3$ **(E)** There are no zeros.

$0 = 4 - e^x$

$e^x = 4$

$x = \ln 4$

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ln(2)/ln(1.045)
      15.74730184
ln(4
      1.386294361
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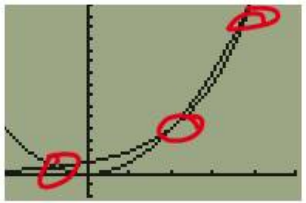
Exploration



47. Let $y_1 = x^2$ and $y_2 = 2^x$.

(a) Graph y_1 and y_2 in $[-5, 5]$ by $[-2, 10]$. How many times do you think the two graphs cross? 3

(b) Compare the corresponding changes in y_1 and y_2 as x changes from 1 to 2, 2 to 3, and so on. How large must x be for the changes in y_2 to overtake the changes in y_1?

(c) Solve for x: $x^2 = 2^x$. $x = 4, x = 2$

(d) Solve for x: $x^2 < 2^x$. $x < -.766$

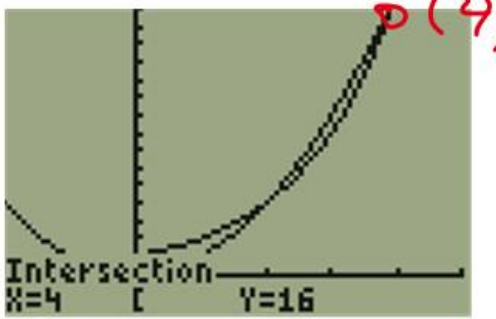
$(-.766, 2) \cup (4, \infty)$

$x: 1 \to 2$

$2^x > x^2$

$x: 2 \to 3$

$x^2 > 2^x$



(4, 16)

For $x > 4$:

$2^x > x^2$