Adv. Functions – Practice Questions Set #1 Name: Key

Practice Question # 1

- The first term of an arithmetic sequence is 36 and the fifteenth term is – 62. What is the common difference? $d=?$

$a_1 = 36 \quad a_{15} = -62$

$-62 = 36 + (15-1)\cdot d$

$\frac{-98}{14} = \frac{14d}{14}$

$d = -7$

Practice Question # 2

- What is the sum for a geometric series $5 + 15 + 45 + \ldots$ up to 13 terms? $S_{13} = ?$

$a_1 = 5 \quad r = \frac{15}{5} = 3 \quad n = 13$

$S_{13} = \frac{5(1-3^{13})}{(1-3)}$

$= 3{,}985{,}805$

Practice Question # 3

- Each year, students at Upton Academy must select class presidents, vice-presidents, and secretaries. If the junior class has 37 students, how many different winning slates are possible?

$37P_3 = 46{,}620$ slates

Practice Question # 4

- What is the probability of drawing a five and a club from a standard deck of cards? (understood no replacement) (multiply)

$\frac{4}{52} \cdot \frac{13}{51} = \frac{52}{2652} = 2\%$

- What is the probability of drawing a King or a red card from a standard deck of cards? (add)

$\frac{4}{52} + \frac{26}{52} - \frac{2}{52} = \frac{28}{52} = 53.8\%$

Practice Question # 5

- Billy typically makes 68% of his free-throw shots. If he shoots 5-free throws, what is the probability that he will get at least 4 of them? $P(4) + P(5) \rightarrow$

${}_5C_4(.68)^4(.32)^1$

$+ {}_5C_5(.68)^5(.32)^0$

$= 48.7\%$

Practice Question # 6

- Mr. Francis teaches two small Algebra 1 classes. Below are his classes' scores on their last test:

1st Period: {78 , 95 , 83 , 80 , 90 , 72 , 45 , 67 , 94 , 89} → $\bar{x} = 79.3$

2nd Period: {63 , 87 , 82 , 91 , 54 , 74 , 85 , 94 , 97 , 81} → $\bar{x} = 80.8$

What is the ***difference*** between the means of the classes' scores?

$80.8 - 79.3 = 1.5$

Practice Question # 7

- Solve for x:

a.) $4e^{x+3} - 6 = 26$

$+6 \quad +6$

$\frac{4e^{x+3}}{4} = \frac{32}{4}$

$e^{x+3} = 8$

$\ln e^{x+3} = \ln 8$

$x + 3 = \ln(8)$

$-3 \quad -3$

$x = -.92056$

b.) $\log_2(\ln x + 4) = 3$

$2^3 = \ln x + 4$

$8 = \ln x + 4$

$-4 \quad -4$

$4 = \ln x$

$e^4 = e^{\ln x}$

$x = e^4$

$x = 54.59982$

Practice Question # 8

- Given the function: $f(x) = \begin{cases} 2x-5 & \text{if } x \le 1 \\ 4-3x^2 & \text{if } x > 1 \end{cases}$

Find: $f(4) + 2f(-3) - 5f(1)$

$f(4) = 4 - 3(4)^2 = -44$

$f(-3) = 2(-3) - 5 = -11$

$f(1) = 2(1) - 5 = -3$

$\Rightarrow -44 + 2(-11) - 5(-3)$

$= -57$

Practice Question # 9

- A power function contains the points (4 , 8) and (6 , 10).

What is the value of y when x = 15?

L1	L2
4	8
6	10

regression equation $\Rightarrow$

$y = 3.730374716(x)^{.5503397132}$

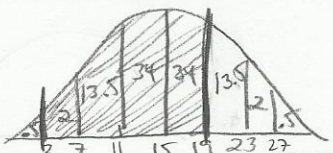
$x = 15$ } table

$y = ?$

$y = 16.6$

Practice Question # 10

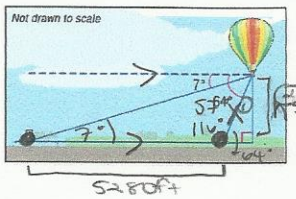
- The shelf life of a particular dairy product is normally distributed with a mean of 15 days and a standard deviation of 4 days. What percent of the products lasts between 3 and 19 days?



$2 + 13.5 + 34 + 34 =$ 83.5%

Practice Question # 11

- A hot-air balloon crosses over a straight portion of interstate, its pilot eyes two consecutive mile posts on the same side of the balloon. How high is the balloon? in feet



① $\frac{5280}{\sin 57} = \frac{x}{\sin 7}$

$x = 767.3$

② $\sin 64 = \frac{h}{767.3}$

$h = 767.3 \sin 64$

$h = 689.6$ ft

Practice Question # 12

- Ships and airplanes measure distance in nautical miles. The formula 1 nautical mile = 6077 – 25 cos (2θ) is given where θ = latitude line in degrees. What is the degree of latitude if a ship is 6,061.5 nautical miles from this latitude line?

$6061.5 = 6077 - 25\cos(2\theta)$

$-15.5 = -25\cos(2\theta)$

$\frac{-15.5}{-25} = \frac{-25\cos(2\theta)}{-25}$

$.62 = \cos(2\theta)$

$\frac{\cos^{-1}(.62)}{2} = \frac{2\theta}{2}$

$\theta = 25.8°$