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For which of the following surfaces is the range of albedos the greatest?

A) Meadow
B) Crop
C) Desert
D) Snow

Surface	Minimum albedo	Maximum Albedo
Meadow	0.11	0.19
Crop	0.16	0.24
Dry soil	0.22	0.34
Desert	0.26	0.29
Snow	0.41	0.84

An albedo is the amount of light reflected from a surface divided by the amount of light falling on the surface. The amount is typically measured in watts per square meter. The table shows the minimum and maximum albedos for different types of surfaces on Earth.

2

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The table shows the maximum depth, in meters, of the 5 deepest oceanic trenches.

Trench name	Depth (meters)
Kermadec	10,047
Kuril-Kamchatka	10,500
Mariana	11,033
Philippine	10,540
Tonga	10,882

What is the range, in meters, of these 5 trench depths?

A) 151 C) 835
B) 533 D) 986

3

23

In 1929, the astronomer Edwin Hubble published the data shown. The graph plots the velocity of galaxies relative to Earth against the distances of galaxies from Earth.

Velocity-Distance Relation among Galaxies

There are four galaxies shown in the graph at approximately 0.9 Mpc from Earth. Which of the following is closest to the range of velocities of these four galaxies, in kilometers per second?

A) 100
B) 200
C) 450
D) 700

Hubble's data can be modeled by the equation $v = 500d$, where v is the velocity, in kilometers per second, at which the galaxy is moving away from Earth and d is the distance, in megaparsecs, of the galaxy from Earth. Assume that the relationship is valid for larger distances than are shown in the graph. (A megaparsec (Mpc) is 3.1×10^{19} kilometers.)

4

18

A) Data set A
B) Data set B
C) Data set C
D) Data set D

The box plots shown summarize the data in each of four data sets. Which of the four data sets has a range of 6?

5

15

Each of the box plots shown summarizes a data set. Data set A has a range of 130, and data set B has a range of 80. If the two data sets are combined into one data set, what is the range of the combined data set?

A) 50 C) 150
B) 105 D) 210

6

17

Data set A	25,550	40,430	49,150	62,590	73,670	118,780	126,040
Data set B	22,860	55,020	173,730	300,580	358,920	456,170	603,300

Which of the following is true about the standard deviations of the two data sets in the table above?

A) The standard deviation of data set B is larger than the standard deviation of data set A.
B) The standard deviation of data set A is larger than the standard deviation of data set B.
C) The standard deviation of data set A is equal to the standard deviation of data set B.
D) There is not enough information available to compare the standard deviations of the two data sets.

7

23. The tables below give the distribution of high temperatures in degrees Fahrenheit (°F) for City A and City B over the same 21 days in March.

Which of the following is true about the data shown for these 21 days?

A) The standard deviation of temperatures in City A is larger.
 B) The standard deviation of temperatures in City B is larger.
 C) The standard deviation of temperatures in City A is the same as that of City B.
 D) The standard deviation of temperatures in these cities cannot be calculated with the data provided.

City A	
Temperature (°F)	Frequency
86	3
79	14
78	2
77	1
76	1

City B	
Temperature (°F)	Frequency
86	8
79	3
78	2
77	4
76	6

8

23. The dot plot show the distribution of heights, in inches, of members from four basketball teams. Of the data sets summarized by the dot plots, which has the smallest standard deviation?

9

24. Two independent surveys asked random samples of 500 people about the distances they commute to work each day. The results of the surveys are detailed in the table below.

Daily Commuting Distance		
Survey	Mean (miles)	Standard deviation (miles)
A	13.9	1.5
B	15.1	1.5

Which statement is true based on the results of these surveys?

A) There is a greater variation in the distribution of the distances people commute to work in Survey A.
 B) There is a greater variation in the distribution of the distances people commute to work in Survey B.
 C) The variation in the distribution of the distances people commute is the same in both surveys.
 D) It is impossible to determine the variation in the distribution of the distances people commute because the means are different.

- 1 D
- 2 D
- 3 D
- 4 D
- 5 C
- 6 A
- 7 B
- 8 D
- 9 C