DO NOW

What are the mean, median and mode?

10.2 Measures of Central Tendency

mean - average $= \dfrac{\text{Sum of all items}}{\text{\# of items}}$

median - middle item from PROPERLY SEQUENCED data (in order)
☀ If even # of items → average the two middle items.

mode - most common item
↳ There may be one mode, no mode, or more than one mode.

Examples:

1 - 3 Use the following data:
   10, 9, 2, 12, 10

1. What is the mean?
   $$\dfrac{10+9+2+12+10}{5} = \dfrac{43}{5} = \boxed{8.6}$$

2. What is the median?
   2, 9, 10, 10, 12
   $\boxed{10}$

3. What is the mode?
   $\boxed{10}$

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4 - 5 Find the mean for the following sets.

4. 16, 16, 19, 17, 84
   $$\dfrac{16+16+19+17+84}{5}$$
   $$\dfrac{152}{5}$$
   $\boxed{30.4}$

5. 7, 3, 9, 21
   $$\dfrac{7+3+9+21}{4}$$
   $$\dfrac{40}{4}$$
   $\boxed{10}$

6 - 7 Find the median for the following sets.

6. 3, 8, 12, 7, 1, 0, 4
   0, 1, 3, 4, 7, 8, 12
   $\boxed{4}$

7. 21, 24, 23, 22, 20, 24, 23, 21
   20, 21, 21, 22, 23, 23, 24, 24
   $$\dfrac{22+23}{2}$$
   $$\dfrac{45}{2} = \boxed{22.5}$$

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8 - 10 Find the mode for the following sets.

8. 2, 2, 3, 8, 4
   $\boxed{2}$

9. 1, 2, 3, 2, 1, 2, 1
   $\boxed{1 \text{ and } 2}$

10. 3, 9, 21, 75, 0, 6
   $\boxed{\text{no mode}}$

11. For the set of data 8, 8, 9, 10, 15, which statement is true?
   a. mean < median   ⓑ mean > mode
   c. median < mode   d. mean = median

   mean: $\dfrac{8+8+9+10+15}{5}$
   $\dfrac{50}{5}$
   10

   median: 9

   mode: 8

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12. Jasmine has gotten 80, 78, 85, and 82 on four successive history tests. What score must she get on her fifth test to get a mean of 80?

   let x = 5th test score
   $$\dfrac{80+78+85+82+x}{5} = 80$$

   ☀ Cross multiply
   $$\dfrac{x+325}{5} = \dfrac{80}{1}$$

   $$x + 325 = 80(5)$$
   $$x + 325 = 400$$
   $$x = 400 - 325$$
   $$x = 75$$
   $\boxed{\text{She must get a 75\%.}}$

13. Pedro's Luncheonette is open six days a week. His lunch business income for the first five days this week was $120, $110, $200, $300, and $140. How much must he make on the sixth day to average $200 income for the six days?

let $x = 6^{th}$ day

$$\frac{120+110+200+300+140+x}{6} = 200$$

$$\frac{x+870}{6} = 200$$

$$x + 870 = 200(6)$$
$$x + 870 = 1200$$
$$x = 1200 - 870$$
$$x = 330$$

$\boxed{\text{He must make } \$330.}$

14. So far, Sonya's average is 84 for 3 math tests. What must she get on the next test to raise her average to 88?

let $x =$ next test score

$$\frac{84+84+84+x}{4} = 88$$

$$\frac{x+252}{4} = 88$$

$$x + 252 = 88(4)$$
$$x + 252 = 352$$
$$x = 352 - 252$$
$$x = 100$$

$\boxed{\text{She needs a } 100\%.}$

HOMEWORK

Worksheet - HW 10.2