

Questions on 8.5 HW? We need to go over our groups from 8.5 classwork...look that over.

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0. Cluster (D, I, O)

P. Stratified (C, F, P)

4. What might be some of the advantages and disadvantages of each type?

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M. **Simple Random (A,H,J,N)**      **Systematic (B,L,N)**

X				X
	X			
		X		
X			X	
	X			X
	X			
			X	

or  
Stratified

4 > 12  
6 > 12  
28 > 12  
40 > 12  
52 > 12

X				X
	X			X
		X		
	X			
			X	
	X			X
			X	
	X			X

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The screenshot shows the Adobe Acrobat Reader DC interface. The window title is "SM3H - Module 8 SE.pdf - Adobe Acrobat Reader DC". The menu bar includes "File", "Edit", "View", "Window", and "Help". The toolbar shows various icons for file operations and navigation. The document content is on page 28 of 44, with a zoom level of 125%. The text on the page includes:

G. You are in charge of school activities. You want to know what activities students would prefer to participate in during the school year. You make a lot of copies of the survey about

*Volunteer*

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the activities that students prefer and you put them on a table outside the cafeteria. Students can choose to take the survey and drop their responses into a big box on the table.

H. You are interested in finding out the percent of residents in the city that have experienced a robbery in the past year. Using the city property records, you assign each residence a number. You use a random number generator to give you a list of numbers. You contact the residences that correspond to that number to ask your questions.

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E. You are in charge of school activities. You want to know what activities students would prefer to participate in during the school year. You stand in the cafeteria during your lunch break and ask students in they would be willing to participate in your survey as they walk by.

Convenience (E, K)

F. You are in charge of school activities. You want to know what activities students would prefer to participate in during the school year. You use the rolls from each homeroom class. You put the all the names from one class into the bowl and draw two names from the class. You go through each homeroom class, drawing 2 names from each class. You ask those students to respond to a survey about the activities they prefer.

G. You are in charge of school activities. You want to know what activities students would prefer to participate in during the school year. You make a lot of copies of the survey about

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**For each scenario, identify what type of sampling was used to obtain the sample. Explain whether or not you think the sample will be representative of the population it was sampled from:**

*Cluster, stratified, simple random, volunteer, convenience, systematic*

8. Elvira surveys the first 60 students in the lunch line to determine if students at the school are satisfied with school lunch. Type of sample: Representative? Explain.

9. Elvira selects every 5<sup>th</sup> student in the lunch line to determine if students at the school are satisfied with school lunch. Type of sample: Representative? Explain.

10. Elvira randomly selects 7 different tables in the lunchroom and surveys every student on the table to determine if students at the school are satisfied with school lunch. Type of sample: Representative? Explain.

11. Elvira assigns every student in the school a number and randomly selects 60 students to survey to determine if Type of sample:

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**For each function identify the amplitude, period, horizontal shift, vertical shift and the endpoints of the primary interval.**

14.  $f(t) = 120 \cos\left(\frac{\pi}{4}(t - 3)\right) + 30$

Amplitude:  
 Period:  
 Horizontal Shift:  
 Vertical Shift:  
 End Points:

15.  $f(t) = 3.5 \sin\left(\frac{\pi}{6}t + \frac{\pi}{3}\right) + 7$

Amplitude: 3.5  
 Period:  $2\pi \div \frac{\pi}{6} = 2\pi \cdot \frac{6}{\pi} = 12$   
 Horizontal Shift:  $\frac{1}{3}$  to left  
 Vertical Shift: 7  
 End Points:

$f(x) = a \sin(bx + c) + d$

$\frac{2\pi}{b} = \text{period}$

$\frac{2\pi}{\text{period}} = b$

15. Graph  $f(x) = \frac{1}{2} \sin(x - 3) + 2$ .

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SAGE REVIEW PACKET:

-Work on #26-39 today



## 8.6 Let's Investigate

### *A Solidify Understanding Task*

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When we want to draw conclusions about some population, there are at least two different statistical ideas to consider. We learned about sampling in *Would You Like to Try a Sample*, since it is usually more practical to sample the population rather than somehow measure everyone or everything in the population.

The second thing to consider is how to measure the parameter of interest, the thing we want to know about the population. Sometimes it's obvious, like if you want to know the average weight of a population, you determine a sample and then put each of the subjects on a scale. Three other techniques are the following:

- **Surveys:** When they want to know how people feel, what their preferences are, what they own, how much they make, etc., researchers often construct a survey to ask the people in the sample about the parameter of interest.
- **Observational Studies:** In this type of study, researchers observe the behavior of the participants/subjects without trying to influence it in any way so they can learn about the parameter of interest.
- **Experiments:** In an experiment, researchers manipulate the variables to try to determine cause and effect. *control group & experimental group*

1. Imagine that you want to know whether a new diet plan is effective in helping people lose weight. You might choose any of the three methods to determine this.

If you used a survey, you could simply ask people that had tried the diet plan in they lost weight.

If you used an observational study, you might monitor volunteers that try the diet plan and measure how much weight they lost.

If you used an experiment, you might randomly assign participants to two groups. One group (the control group) eats as they normally would and the other group (the experimental group) eats according to the diet plan. At the end of two months, the two groups are compared to see the average weight gain or loss in each group.

Based on these three examples,

- a. What are some possible advantages and disadvantages of surveys?

*D: People might lie about weight loss.*

b. What are some possible advantages and disadvantages of observational studies?

A: Data ☺

D: volunteers ☹

c. What are some possible advantages and disadvantage of experiments?

A: Data ☺

2. Identify which method is illustrated by each example:

a. To determine whether drinking orange juice prevents colds, researchers randomly assigned participants to a group that drank no orange juice or a group that drank two glasses of orange juice a day. They measured the number of colds that each group had over the course of the year and compared the results of the two groups. *experiment*

b. To determine whether exercise reduces the number of headaches, researchers randomly selected a group of participants and recorded the number of hours each participant exercised and the number of headaches each participant experienced. *observational study*

c. To determine the effectiveness of a new advertising campaign, a restaurant asked every tenth customer if they had seen the advertisement, and if it had influenced their decision to visit the restaurant. *Survey*

d. To determine if a new drug is an effective treatment for the flu, researchers randomly selected two groups of people that had the flu. One group was given a placebo (a sugar pill that has no physical effect) and one group was given the new drug. Researchers measured the number of days that participants experienced flu symptoms and compared the two groups to see if they were different. *experiment*

e. To determine if higher speed limits cause more traffic fatalities, researchers compared the number of traffic deaths on randomly selected stretches of highway with 65 mph speed limits to the number of traffic deaths on an equal number of randomly selected stretches of highway with 75 mph speed limits. *observational study*

**\*\*We are skipping #3-6 on pgs. 34-35\***

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12. What are the leading coefficient and degree of the polynomial?

$$-5x + 20x^3 + 1 - 8x^4$$

Leading coefficient:

Degree:

13. Simplify.

$$\frac{36(2w+5)^4(w-2)^4}{30(w-2)^3(2w+5)^5}$$

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7. Multiply.

$$(7x^2 - 4x + 2)(3x - 5)$$

Simplify your answer.

$$21x^3 - 35x^2 - 12x^2 + 20x + 6x - 10$$


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$$21x^3 - 47x^2 + 26x - 10$$

8. Consider the following polynomial functions.

$$f(x) = -3(x+1)^2(x+3)^2$$

$$g(x) = x^3 - x^2 - 6x$$

Choose the graph of each function from the choices below.

**Graph A**

**Graph B**

**Graph C**

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**16. Simplify.**

$$\frac{x-8}{x^2-64}$$

**17. Simplify.**

$$\frac{u^2+3u-28}{32-2u^2} = \frac{(u+7)(u-4)}{-2u^2+32} = \frac{(u+7)(u-4)}{-2(u^2-16)} = \frac{(u+7)(u-4)}{-2(u-4)(u+4)} = \frac{u+7}{-2(u+4)}$$

**18. Choose the end behavior of the graph of each polynomial function.**

(a) $f(x) = x^5 - 3x^3 - 2x^2 + 2$
{(a) Rises, (b) Falls} to the left and {(a) rises, (b) falls} to the right.
(b) $f(x) = 3x^3 + 6x^2 + 9x + 4$
{(a) Rises, (b) Falls} to the left and {(a) rises, (b) falls} to the right.
(c) $f(x) = -x(x-3)(5x+2)$
{(a) Rises, (b) Falls} to the left and

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**14. Find all excluded values for the expression.**  $x = 3, -3$   
That is, find all values of  $x$  for which the expression is undefined.  $x = 3, -3$

$$\frac{x^2 + 11x + 18}{x^2 - 9} = \frac{(x+2)(x+9)}{(x+3)(x-3)}$$

If there is more than one value, separate them with commas.

**15. Factor completely.**

$$4y^2 - 28y + 48$$

**16. Simplify.**

$$\frac{x-8}{x^2-64}$$

**17. Simplify.**

$$\frac{u^2 + 3u - 28}{32 - 2u^2}$$

**18. Choose the end behavior of the graph of each polynomial function.**

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Homework

Finish 8.6 "Ready, Set, Go"