

Percent Change

The following questions ask you to find the percent changes in given scenarios. First, take around 10 minutes to work through these practice problems on your own. Next, work with 1-2 partners to discuss the answers and complete the section. *An answer key for these sections will be available at break!*

1. The budget of a government agency increased from \$1.75 million to \$2 million. What percentage increase does this represent?
2. The staff of that agency changed from 90 to 72. What percentage decrease does this represent?
3. A local nonprofit held a 5K to raise awareness and money for its cause. Last year, the event raised \$6,950. This year, the event raised \$10,092. What is the percent of increase in money raised from this event?
4. The increase in donations likely stems from increased participation in the event. Last year, 60 people participated in the event. This year, 87 people participated. What is the percent increase in 5K participation?
5. Your unit's operating budget is \$19,500. Due to positive performance and improved economic conditions, your operating budget is set to increase 15% heading into next year. If this holds, what do you expect your operating budget to be?
6. After informing you of the expected budget increase, your supervisor is curious about how performance improved. You cite emphasizing LEAN management principles over the past few months as an explanation for more efficient unit performance. It used to take 16 hours and 47 minutes to make a final determination on applications – now it only takes 7 hours and 20 minutes. What percentage improvement in efficiency does this represent?

Rearranging and Solving Equations**Write x in terms of y.**

1. $y = 7x + 10$

Solve for t.

2. $2t^2 - 11 = 0$

3. $3t^2 - 10 = 0$

4. $12 = -4(-6t - 3)$

5. $3t - 5 = -8(6 + 5t)$

Systems of Equations

In this section, you will find the solutions set to the following systems of equations (i.e., you will find the (x, y) coordinate pair that simultaneously makes both equations “true.”). Again, work on your own for around 10 minutes on the following problems. After that, work 2-3 others to discuss and confirm solutions.

Solve using Substitution.

$$1. \begin{cases} 2x + y = 5 \\ 3x + 5y = 4 \end{cases}$$

$$2. \begin{cases} y = 2 \\ -x - 8y = -12 \end{cases}$$

$$3. \begin{cases} 3x - 4y = 5 \\ 2x + y = 7 \end{cases}$$

Solve using Elimination (There are excellent resources [online](#) if you are not familiar with Elimination).

$$4. \begin{cases} -2x - 4y = 18 \\ 10x + 4y = 6 \end{cases}$$

$$5. \begin{cases} -6x + 7y = -11 \\ 6x - 3y = -9 \end{cases}$$

Slope-Intercept and Graphing

1. Plot the points $(2, 9)$, $(-2, -5)$, $(-4, 10)$, $(3, 7)$, $(9, 0)$, $(-5, 0)$, $(5, -7)$ and $(10, 3)$ on a graph.

If they are not already in this form, write the following equations in the form $y = mx + b$ and identify a) the slope and b) the y-intercept.

2. $3y + 15x - 9 = 0$

3. $7x + \frac{1}{3}y = -4$

4. $y = -1$

5. $-30 + 10y = -2x$

Graph the above equations.

2graph.

3graph.

4graph.

5graph.

6. Find an equation of the line through the given point and with the given slope.

$(0, 4), m = -\frac{1}{4}$

Find the intersection between these two lines.

7.
$$\begin{cases} y = 4x - 1 \\ y = -x + 19 \end{cases}$$

8.
$$\begin{cases} y = -2x + 2 \\ 3x + 2y = 1 \end{cases}$$

Extra Practice

Our next session is Economics preparation. We encourage you to stick around and discuss core economic concepts. In the meantime, feel free to work through this final set of practice questions, either on your own or with a partner. Let us know if you have any questions! Thank you for working with me all morning!

1. You typically drink 16 ounces of coffee per weekday. Starting on the first day of classes (Tuesday August 22), you plan to increase daily coffee consumption by 35% (not compounded – just increasing your average daily intake by 35%). How many ounces of coffee will you consume this week?

$$2. \begin{cases} y = 10 \\ -10x + 4y = -10 \end{cases}$$

3. Sketch the graph of the line $12x + 4y + 20 = 0$

4. Sketch the graph of the line $y = -5$

5. Write the slope-intercept equation of a line that passes through point (3, 8) and has a slope of -2.

Economics Next...

A retail store faces a demand equation for Roller Blades given by: $Q = 220 - 2P$, where Q is the number of pairs sold per month and P is the price per pair in dollars.

a. The store currently charges $P = \$80$ per pair. At this price, determine the number of pairs sold (Q).

b. If management were to raise the price to \$100, how many pairs would the store sell?