10.1 Percentage basics

Which is bigger?

1% or 2%	10% or 2%	10% or 20%
0.01 or 0.02	0.1 or 0.02	0.1 or 0.2
10 or 10%	0.1 or 0.1%	0.01 or 0.01%
100% or 200%	100% or 0.01%	100% or 105%
123 or 1.23	0.123 or 0.3	123 or 3
$\frac{1}{4}$ or $\frac{3}{4}$	$\frac{1}{2}$ or $\frac{1}{4}$	$\frac{3}{4}$ or $\frac{3}{8}$

Convert

10% to decimal	10% to fraction
37% to decimal	37% to fraction
7% to decimal	7% to fraction
0.01% to decimal	0.01% to fraction
25% to decimal	25% to fraction
$\frac{1}{2}$ to decimal	$\frac{1}{2}$ to percentage
$\frac{1}{4}$ to decimal	$\frac{1}{4}$ to percentage
$\frac{3}{4}$ to decimal	$\frac{3}{4}$ to percentage
1.5 to fraction	1.5 to percentage
1.05 to fraction	1.05 to percentage
0.5 to fraction	0.5 to percentage
0.05 to fraction	0.05 to percentage

10.1 Percentage change

Calculate the final amount

20% increase from $100	20% decrease from $100
20% increase from $300	20% decrease from $300
10% increase from $300	10% decrease from $300
1% increase from $100	1% decrease from $100
100% increase from $100	100% decrease from $100

Simplify the repeated changes into just one change

10% increase, then 10% increase

10% increase, then 10% decrease

10% decrease, then 10% increase

10% decrease, then 10% decrease

2% up, 2% up, 2% up

2% up twelve times in a row

Solve for the original amount, before the changes

10% increase ended up being $110

10% increase ended up being $100

10% decrease ended up being $90

10% decrease ended up being $100

10.2: Simple interest Simple interest uses percent change to find a reasonable answer to how much "now" costs.

How much is the interest on the original?

3 months of 2% per month interest on a $100 loan

1 year of 1% per year interest on a $100 loan

1 year of 1% per month interest on a $100 loan

1 month of 12% per year interest on a $100 loan

Which is the cheaper option? You owe $130.56 to the KU, but you don't have it. Your student loan check comes in next week, and you'll be set for the semester, but what to do NOW.

(a) $137.09 late payment

(b) Pay-day loan: 17% per bi-week interest, pay it back in two weeks

(c) Pawn shop: 1% per month interest, $5 fee, pay it back in one month

(d) Credit card: 2% per month interest, pay it back in one month

10.3: Compound interest

If you don't pay back the interest, I guess you borrow it too. Then you have interest on the interest. 10% interest per month means your debt increases by 10% each month.

If you borrow $100 at 2% per month interest (compounded monthly) and don't pay anything back for 3 months, how much do you owe? <small>(which page 2 problem was this?)</small>

If you borrow $100 at 2% per month interest (compounded monthly) and don't pay anything back for a year, how much do you owe? <small>Hint: the next page 2 problem!</small>

If you borrow $100 at 2% per month interest (compounded monthly) for six months, but then the interest rate goes up to 3% per month (c.m.) for another six months, how much do you owe?

10.6: Amortized loans

Simple interest: you pay back interest each month, pay back the original later

Compound interest: you don't pay back anything until the end.

Amortized loan: you pay back the same amount each month, until it is done.

Calculate the amount owed at the end of each month:

You borrow $100 originally at 10% per month interest, and pay back $22.96 at the end of each month.

(a) At the end of the first month, you owe 110% of the original, but you pay back $22.96, so you only owe:

(b) At the end of the second month, you owe 110% of the answer from part (a), but you pay back $22.96, so you only owe:

(c) At the end of the third month, after payment, you owe:

(d) At the end of the fourth month, after payment, you owe:

(e) At the end of the fifth month, after payment, you owe:

(f) At the end of the sixth month, after payment, you owe: