

MA111: Contemporary mathematics

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February 1, 2012

SCHEDULE:

- HW 10.1 is due Friday, Feb 3rd, 2012.
- The second exam is Friday, Feb 17th, during class.
- Mathskeller CB63 for help: MWF 2pm-3pm (Jack), TR 9:30-10:30am (Kaichen)

Today we will look at percentages.

Which is the better deal?

All prices are for the same product.

(A) \$100 original price. 10% off sale. 6% tax.

(B) \$ 90 original price. No sale. 7% tax.

(C) \$110 original price. 20% off sale. 6% tax.

(D) \$100 original price. \$10 off coupon. 6% tax.

(E) \$150 original price. 30% off sale. 6% tax.

Which is the better deal?

- (A) Deduct Johnson Center payment after taxes
- (B) Deduct Johnson Center payment before taxes

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- What if it costs \$100, you make \$100, and you pay 25% tax?

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(B) Deduct Johnson Center payment before taxes

- What if it costs \$100, you make \$100, and you pay 25% tax?
- (A) means you get \$75 after taxes, and spend \$100 on the gym.
\$25 in the hole
- (B) means you get \$100 before taxes, spend it all on the gym, and then are taxed on \$0.
\$0, just broke even

Does it matter how much you make?

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- What if it costs \$100, you make \$1000, and you pay 25% tax?
- (A) means you get \$750 after taxes, and have \$650 after paying for the gym
- (B) means you get \$900 before taxes, and so have \$675 after paying taxes

Does it matter how much you make?

- What if it costs \$100, you make \$1000, and you pay 25% tax?
- (A) means you get \$750 after taxes, and have \$650 after paying for the gym
- (B) means you get \$900 before taxes, and so have \$675 after paying taxes
- You are still \$25 better off with before taxes. Is it a coincidence?

What is a good tip?

- Is \$3 on a \$20 check a good tip?

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- What is a similarly good tip on \$100?
- What is a similarly good tip on \$10?
- What is a similarly good tip on \$30?

Increase and decrease

- If there is 10% tax, and a 10% sale, would you rather have
 - (Z) the list price, no tax, no sale,
 - (A) the tax before the sale, or
 - (B) the sale before the tax?

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- (Z) just means \$100 becomes \$100, no funny business

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- (A) means \$110 with tax, and $\$110 - \$11 = \$99$ with the sale

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- It is a little strange that (A) and (Z) are different

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- (B) means \$90 with the sale, and $\$90 + \$9 = \$99$ with the tax

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- (A) means \$110 with tax, and $\$110 - \$11 = \$99$ with the sale
- It is a little strange that (A) and (Z) are different
- (B) means \$90 with the sale, and $\$90 + \$9 = \$99$ with the tax
- Is it a coincidence that (A) and (B) agree?

Percentages as multiplication

- 15% is the same as 15 out of 100, which is the same as 0.15
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- 15% off means you still pay $100\% - 15\% = 85\%$
- So \$20 with 15% off is both:
\$20 - \$3 = \$17 and
 $(\$20)(0.85) = \17
- 6% tax means total is multiplied by $100\% + 6\% = 106\% = 1.06$

Homework

- Calculations: Percentage decrease, percentage increase
- Read section 10.1 of the textbook.
- Online homework (20%):
 - HW 10.1 is due Friday. Might be a little hard. 9 questions.