

Physics 206 – Newtonian Mechanics

Joseph Ross 448 Mitchell Physics (4th floor this bldg.)

e-mail: jhross@tamu.edu

Office hours: Mon 4-6, Weds 12:45-2, Thurs 1-2
or, email me.

Plan for today:

- (1) Course policies, exams, websites, etc.
- (2) Chapter 1 introduction

I have some clicker practice questions starting on the 4th slide. If you can go ahead and get the iclicker student app, do that.

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office hours: M 4-6, W 12:45-2, R 1-2 or contact me.

- My course web page has the syllabus, & links to required websites: <http://rossgroup.tamu.edu/206page.html>
- mechanics.physics.tamu.edu is the course-wide website, it has much more detailed policies for the course.
- [Canvas](#) has some of the same info, also access to the MasteringPhysics system, which we use for online homework and pre-lectures. Grades will be posted there also.
- Lecture slides from class: I will post them after the class on my course webpage (above). Later watch for a possible change, I'm working on getting a Google drive set up for this.

Things you will need:

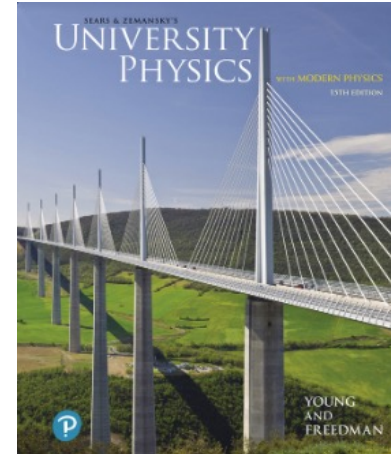
- Text: 15th edition Young/Freedman
used or previous ed. OK

For this course you need vol. 1 (thru ch. 14);

if continuing in Physics 207 you will use volume 2.

Hard-copy version should come with [MasteringPhysics](#),
or an eBook comes with MP separately

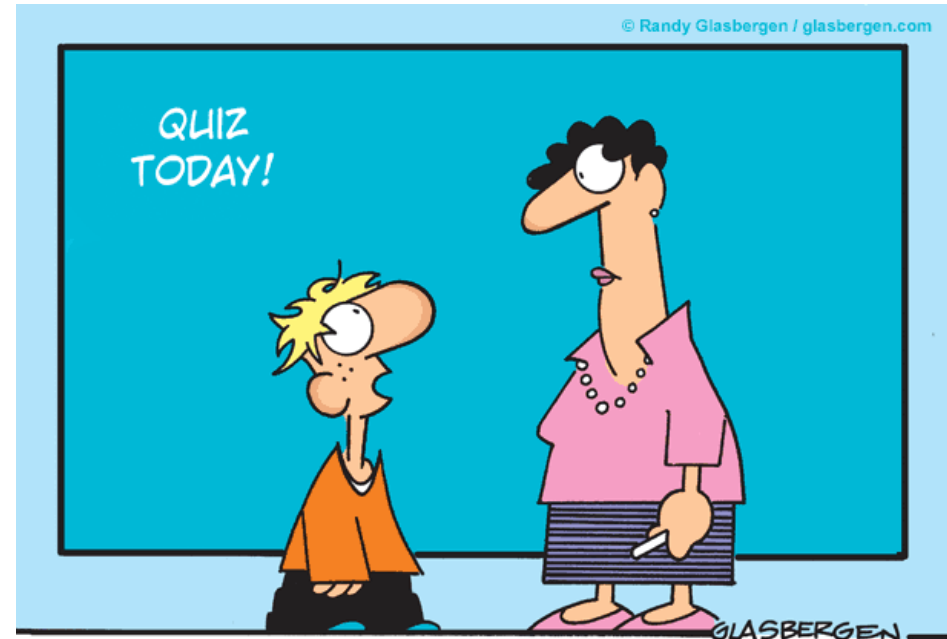
- [iClicker app](#) (instructions next slide)
- [Mastering](#) homework; access it through the Canvas webpage, otherwise it won't work properly. First prelecture is due this Saturday night.
- Concept quizzes: they are built into the Canvas page; first one is also due this Saturday.



Quiz:

(This one not for credit).

Note: you need the
iClicker student mobile app:



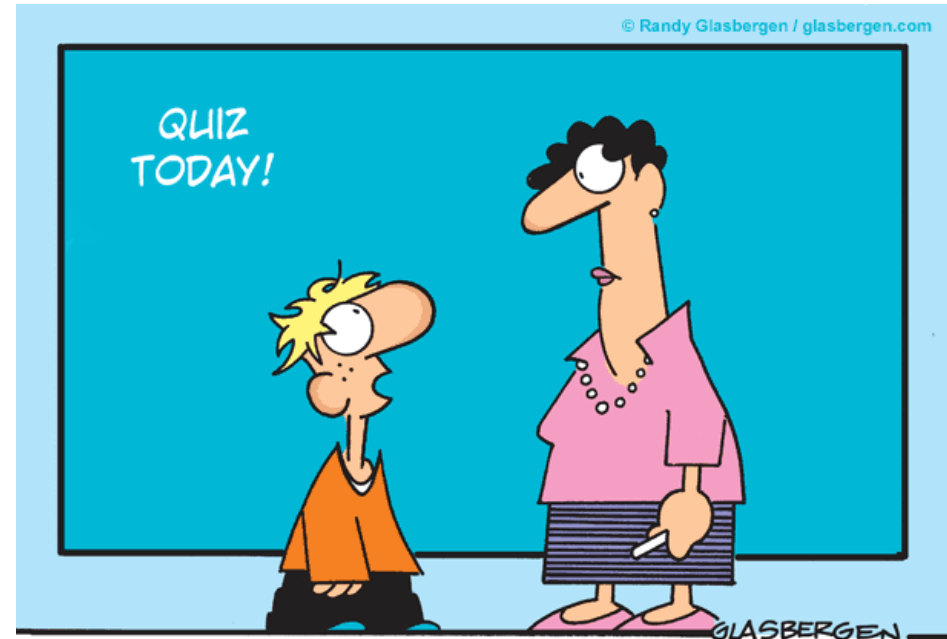
- Register for an account once you have the app (use tamu email).

[Or apparently it also works from a browser without the mobile app if you log in/create an account—search for “iClicker student web app”. (?) I don’t have experience yet as to how well that works.]

- We *won't* use the older “iclicker remotes”.
- Then you need our course-ID, Phys206-Ross-11:30AM-2024a or the *quick link*: <https://join.iClicker.com/SWIS>

Quiz:

(This one not for credit).



John digs a hole 2 feet wide 3 feet long and 1 foot deep, how many cubic feet of dirt are in it?

- a) 6
- b) 0
- c) 3
- d) 5
- e) Impossible to tell.

Another Quiz:

(Also not for credit).

Did you get my email?

- a) Yes
- b) No

Note, for course mail I use a TAMU tamu server that can send messages to all my sections. It most likely goes to your “email.tamu.edu” address. You should check this mailbox, from time to time I need to send updates on schedule changes etc. (and Canvas announcements go to all students, not just mine).

I sent 1 email, and you should have received two emails from Dr. May (course coordinator).

Course Coordinators

Dr. Larry May (larry.may@tamu.edu) and Dr. Mike Youngs (mdyoungs@tamu.edu)

- Contact the course coordinators (copy both) for questions involving:
 - absences and documentation
 - any course grade questions not involving iClicker
 - non-technical issues involving Mastering Physics (i.e. grades, assignments, etc.)
 - Canvas and concept quiz issues (inactive links, missing content)
- For iClicker grade questions and absences, contact your instructor.
- For technical issues (login errors, website being down, etc.) involving Mastering Physics, contact their technical/customer support.
- For information specific to your lecture (i.e. slides, office hours, iClicker) or section (i.e. recitation, TA office hours) contact your Instructor and TA, respectively.
- For emails to the coordinators, put course number and section number in the title and include your UIN
 - Ex. “Phys 206-531: Question about _____”
 - We are responsible for >2000 students this semester, these details will let us help you faster



Absences

All absences involving graded work must be documented according to *University Policy* in order to be considered for excusal.

- Student Rule 07 - <https://student-rules.tamu.edu/rule07/>
 - outlines all parameters for what constitutes an excused absence, how to document it and on what timeline to notify your faculty
 - you are responsible for knowing and following these guidelines
- For absences involving major assignments such as recitation and exams, use the link in the “Absence Report Form” Module on Canvas
 - Documentation verifying absence **must** be included in this form in order for an absence to be considered for excusal
 - This form must be filled out within 2 business days of the last date of absence (per SR07), or the absence will be unexcused
 - **If you are waiting on documentation, fill out the form within 2 days.** The documentation can be added to the form after submission, as soon as you have it. (“**No exceptions.**”)
- For absences from lecture involving iClicker, directly contact your lecture instructor, do *not* use the absence form.



Absences (cont.)

- Excused absences as defined by Student Rule 07 only apply to *physical* attendance and participation, not online work with extended access windows
 - Extensions for online submissions are not possible unless your absence documentation explicitly specifies your inability to complete *online* work for an *extended* period of time
- Technology failure (such as servers being offline, power outage, device stopped working, lack of internet, etc.) do **not** constitute excused absences for online submissions
 - The due dates for online submissions are *final* due dates, not the day you have to start it – begin working on assignments early to stay ahead and prevent last-minute catastrophes
- All excused absences will be judged at the sole discretion of the course coordinators (**not me!**)



Exams

- Common exams (same exam and time for all 206 students)
 - Exam 1 Mon 2/12 7:30-9:30pm
 - Exam 2 Mon 3/25 7:30-9:30pm
 - Exam 3 Mon 4/15 7:30-9:30pm
- Comprehensive Exam (the final “not a final” exam)
 - Friday 4/26 5:00-7:00pm
- Locations of Exams are TBD, probably not this room -- will be announced before exams
- You are expected to bring something to write with, an appropriate calculator and your student ID to all exams
 - All other exam materials will be provided (e.g. a formula sheet, they are posted along with some old exams -- see webpage)



Required Materials

- The text, “University Physics”, 15th ed., Young and Freedman, Chapter 1-11, 13-14
- Canvas for registration to Pearson’s online homework (Mastering Physics)
- iClicker app or access: we already saw this.
- A calculator that cannot wirelessly connect to the internet
 - This means no “smart” devices are allowed: no phones, tablets, laptops or smart watches during exams
 - A student using a non-approved calculator or “smart” device on an exam will obtain a zero for that exam.
 - For full list of approved calculators, we use the SAT calculator policy
 - <https://satsuite.collegeboard.org/sat/what-to-bring-do/calculator-policy>



Grade Breakdown

- Grades based on the following criteria.

- Exam total (LOs) (70%)
- Recitation (6%)
- iClicker (6%)
- Mastering Physics Chapter Homework (6%)
- Prelectures (6%)
- Concept Quizzes (Canvas) (6%)

Total (100%)

- Letter-grade breakdown :

- $\geq 90 = A$
- 80-89 = B
- 65-79 = C
- 50-64 = D
- $< 50 = F$



Due dates

- **Homework** assignments are due by midnight two nights before an exam
 - Example: Ch. 1-3 + Math Review due **Sat. Feb. 10th** by 11:59pm
 - **Prelectures** are due Saturday nights by 11:59pm the weekend before we will start a topic (according to the schedule on the syllabus)
 - Example: Ch. 1 & 2 prelectures are due **Sat. Jan. 20th** by 11:59pm
 - **Concept quizzes** are due by midnight two nights before an exam
 - Example: Ch. 2 & 3 quizzes due **Sat. Feb. 10th** by 11:59pm
 - Special Case: the Syllabus, Canvas and Course Information quiz is due **Sat. Jan. 20th** by 11:59pm as this is the end of the first week of class
- > **You have two things due this week.** (I don't know yet if those will be extended due to weather delay, possibly not)
- > **The next due date comes right before the first exam, please start those things early!!**



Late work policies

- Homework
 - Not accepted late << **start them early!**
- Prelectures
 - 20% penalty per day
- Concept Quizzes
 - Not accepted late << **start them early!**



Homework: Assignments are listed in MasteringPhysics website (through Canvas).

Also includes the prelectures, one due this Saturday.

Get a code and try accessing the HW site via Canvas soon.

In case of difficulty:

- Try a different browser.
- For problems *solving* the HW, email me or see me in office hours, I will help or provide hints etc.
- For other technical issues you probably need to contact MP through the contact info on their webpage.
- **Also** note the **"Introduction to Mastering Physics"** no-credit assignment, and the **Extra Practice problems** posted on the Mastering course page, those are useful.

NEED HELP WITH YOUR PEARSON PRODUCTS?

ATTEND VIRTUAL OFFICE HOURS!
TUESDAY THROUGH FRIDAY
JAN. 16 - JAN. 19

10 AM - 11 AM
&
3PM - 4PM
DAILY

ZOOM INFO

MEETING ID: 922 2709 2076

PASSCODE: PEARSON24

[HTTPS://T.LY/H0492](https://t.ly/H0492)

← click the
link to join!

*YOU'LL BE JOINING A LIVE, LOCAL PEARSON REP ON ZOOM.
FOR HELP OUTSIDE OF THESE HOURS, PLEASE VISIT
[ASKPEARSONSUPPORT.COM](https://www.pearson.com/ask-pearson-support)

Pearson

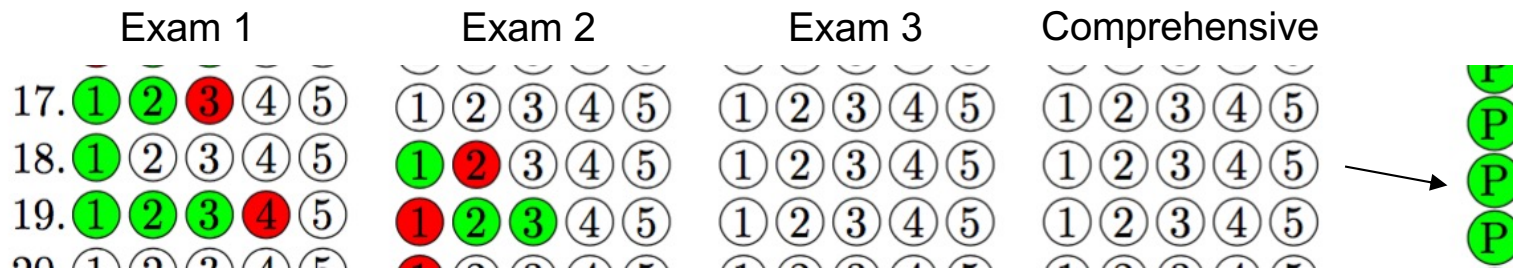
Clickers (Today does **not** count)

- You must bring your device to class & log in to receive credit, starting next class.
- Most questions are “participation” questions, some require correct answer.
- For registration:
 - See the link on mechanics.physics.tamu.edu.
 - If I get further updates I will post them
- You get 1 “free day” (makes up for forgetting, etc.) Grading each day: 1 point for participating in all quizzes, 1 point for correct answers if there is a graded quiz.
- The scores are going to be normalized across lectures. I should be able to get the scores posted periodically on Canvas so you can track your progress.

(I'm not certain yet how that will work with normalization.)

Exam grading → learning objectives

- grading scheme for midterm and comprehensive exams is based on how many learning objectives you have achieved (rather than a numerical grade)
- The list of last year's learning objectives may be viewed at the mechanics.physics.tamu.edu website. **Note we are making a few changes**, final version expected next week.
- Your course exam grade will be based on the fraction passed over the whole semester. You need to achieve $\geq 60\%$ in order to pass an objective
- If an objective is tested in the comprehensive exam and you pass it, then this replaces the previous tries, and you will be considered as having mastered this learning objective

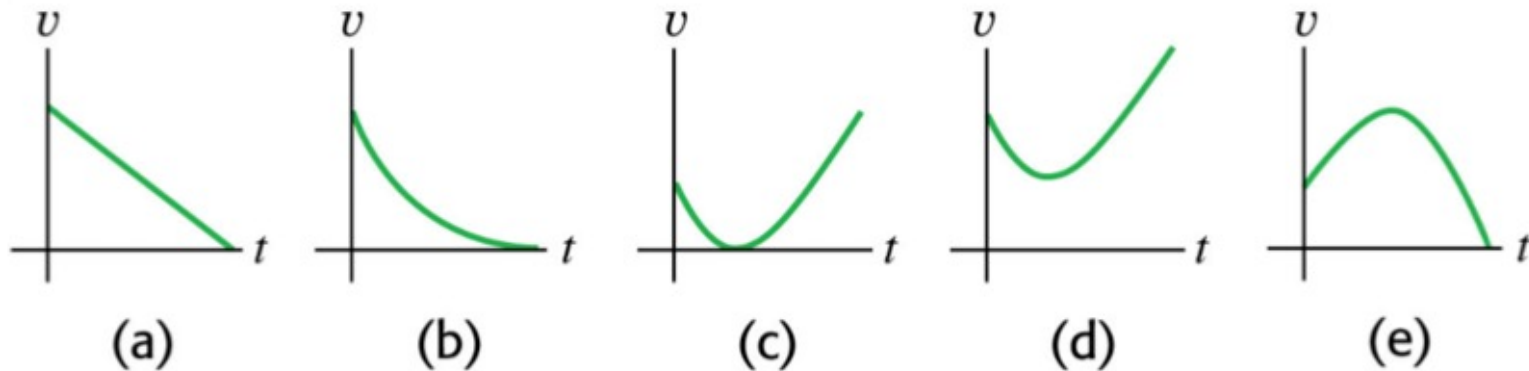


Example

Example from before:

LO 14: Be able explain the concept of "equations of motion". Be able to compute position and velocity as a function of time when given the acceleration as a function of time and initial velocity and position. The same for linear and angular position and velocity. Describe how that looks in mathematical form

5) A stone is thrown into the air at an angle above the horizontal and feels negligible air resistance. Which graph can represent the correct dependence of the stone's speed v on time t while the stone is in the air?



More discussion about grading scheme to come before exam 1.

Units: **We use SI (MKS) almost exclusively**

Fundamental MKS units:

meter (m) – length

kilogram (kg) – mass

second (s) – time

Derived units examples:

Newton (N) = $\text{kg}\cdot\text{m}/\text{s}^2$ (force)

Watt (W) = $\text{kg}\cdot\text{m}^2/\text{s}^3$ (power)

(there are full details about these units in an Appendix to Young/Freedman)

Example:

speed = distance/time, normally in m/s

- 60 mi./hr. convert to m/s?

note 1 mile \cong 1609 m

(for conversions think "multiply by 1")

Example:

speed = distance/time, normally in m/s

- 60 mi./hr. convert to m/s?
(~ 27 m/s)
- Travel for 2.0 s at 30 m/s. Distance = ?
 - a) 10 m
 - b) 20 m
 - c) 30 m
 - d) 60 m
 - e) 90 m

Example:

speed = distance/time, normally in m/s

- 60 mi./hr. convert to m/s?

(~ 27 m/s)

- Travel for 2.0 s at 30 m/s. Distance = ?

a) 10 m

b) 20 m

c) 30 m

d) 60 m

e) 90 m

distance = speed × time

Multipliers:

TABLE 1.1 Prefixes for powers of ten

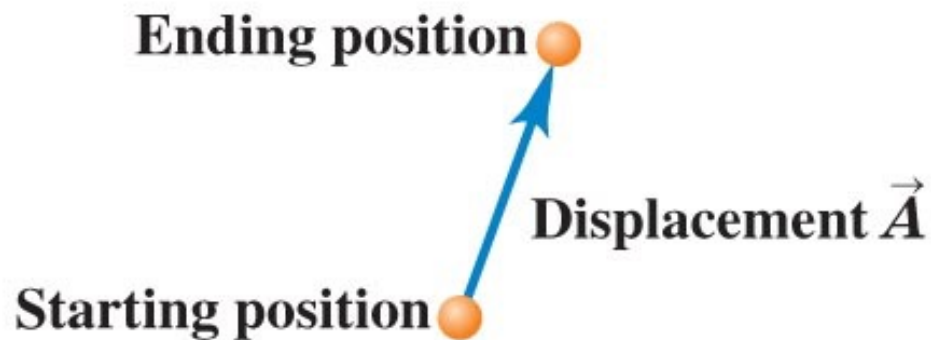
Power of ten	Prefix	Abbreviation
10^{-18}	atto-	a
10^{-15}	femto-	f
10^{-12}	pico-	p
10^{-9}	nano-	n
10^{-6}	micro-	μ
10^{-3}	milli-	m
10^{-2}	centi-	c
10^3	kilo-	k
10^6	mega-	M
10^9	giga-	G
10^{12}	tera-	T
10^{15}	peta-	P
10^{18}	exa-	E

Vectors: value + direction.

■ Example: “1.00 km North”

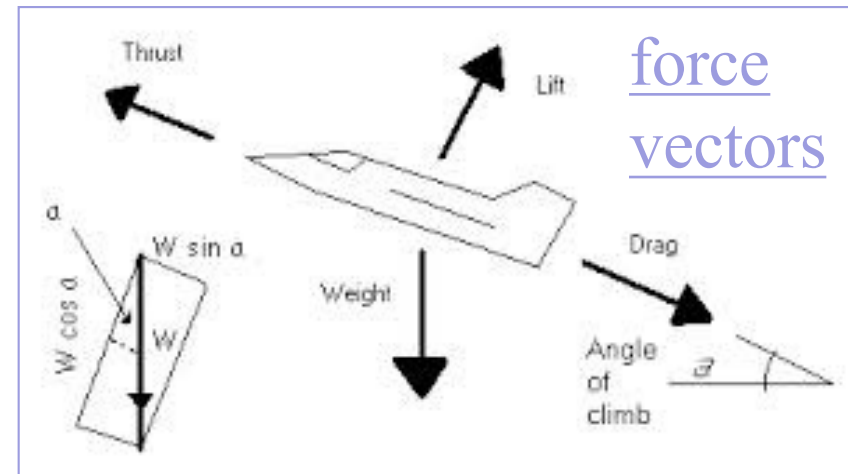
Notation:

Handwritten notation: \vec{A}

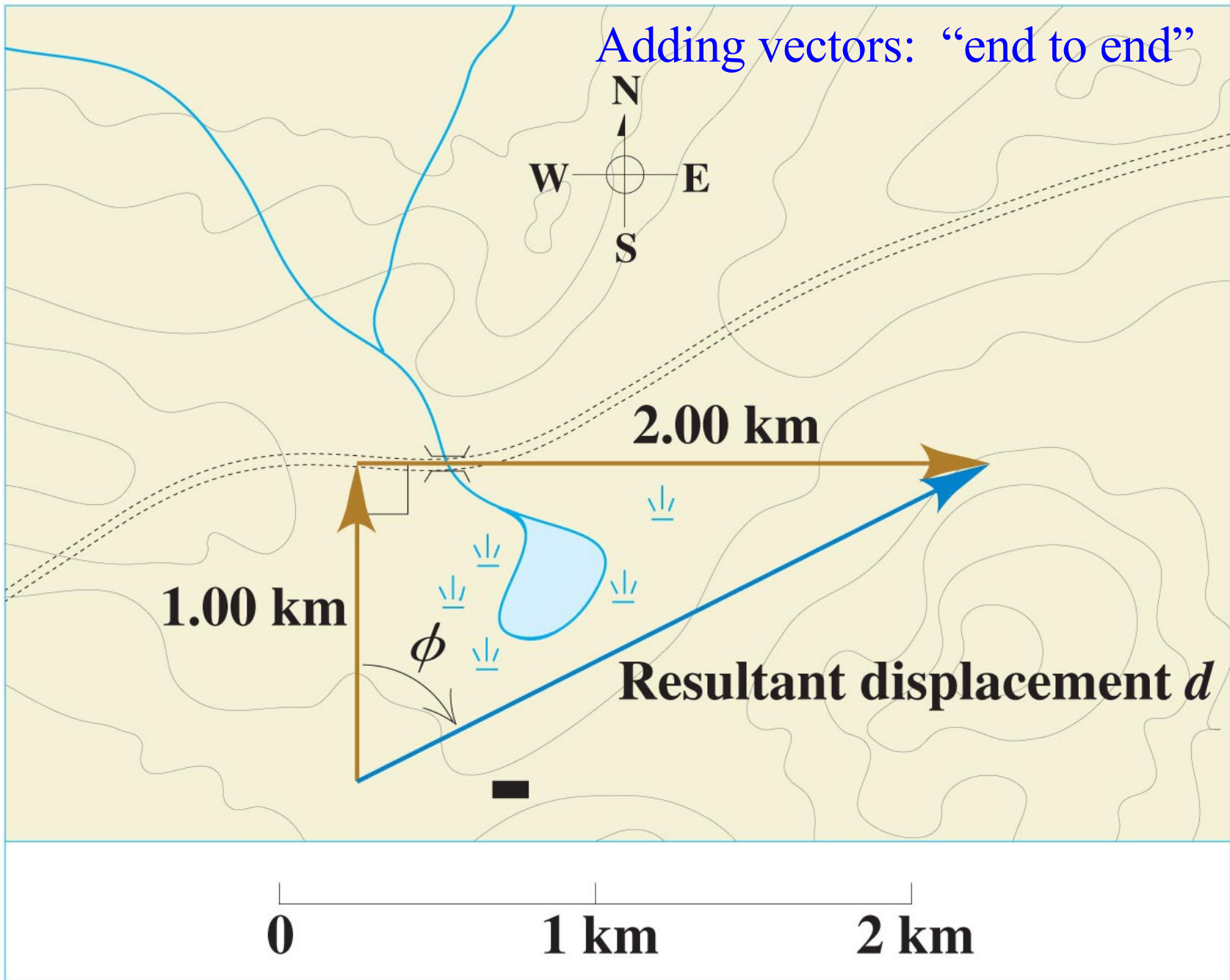


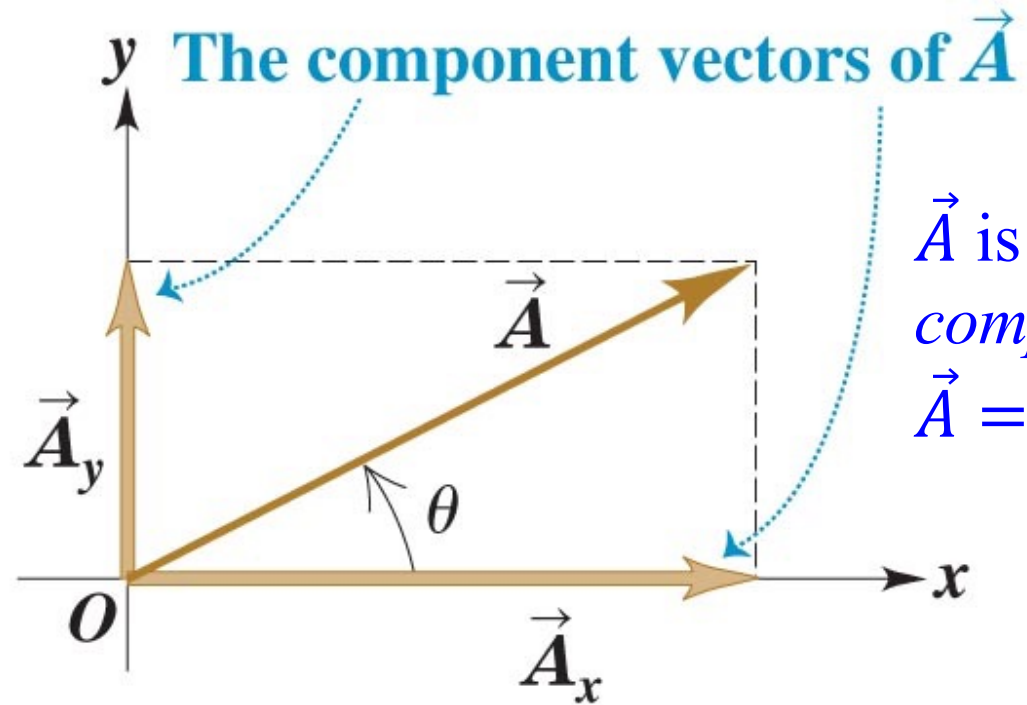
(a)

The displacement depends only on the starting and ending positions—not on the path taken.

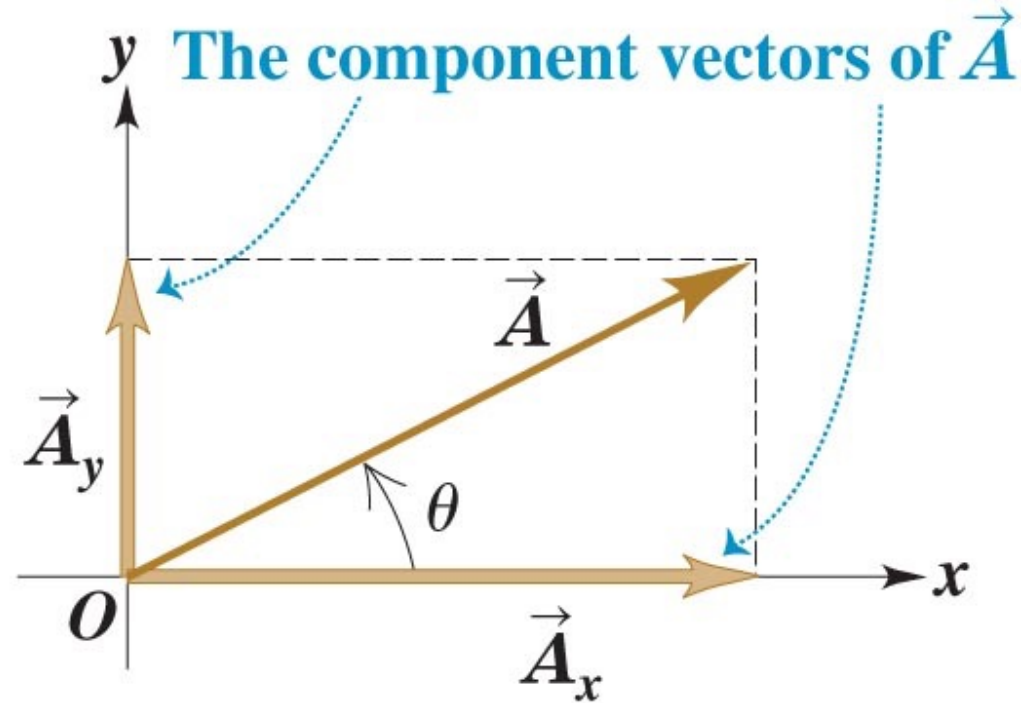


Also note: starting position doesn't have to be the origin.





- y component of \vec{A} ?
 - $A \tan \theta$
 - $A \cos \theta$
 - $A \sin \theta$
 - $A \arcsin \theta$



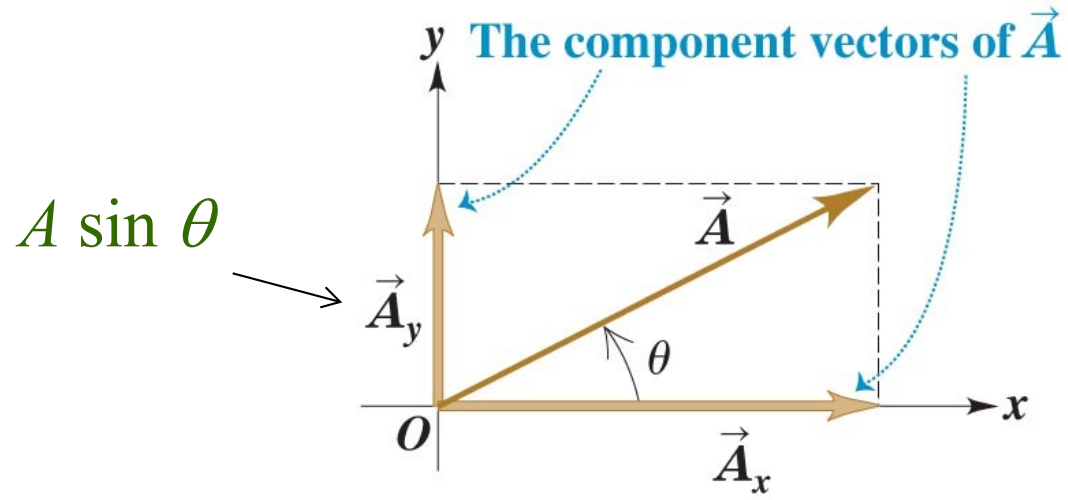
- y component of \vec{A} ?

- a) $A \tan \theta$
- b) $A \cos \theta$
- c) $A \sin \theta$
- d) $A \arcsin \theta$

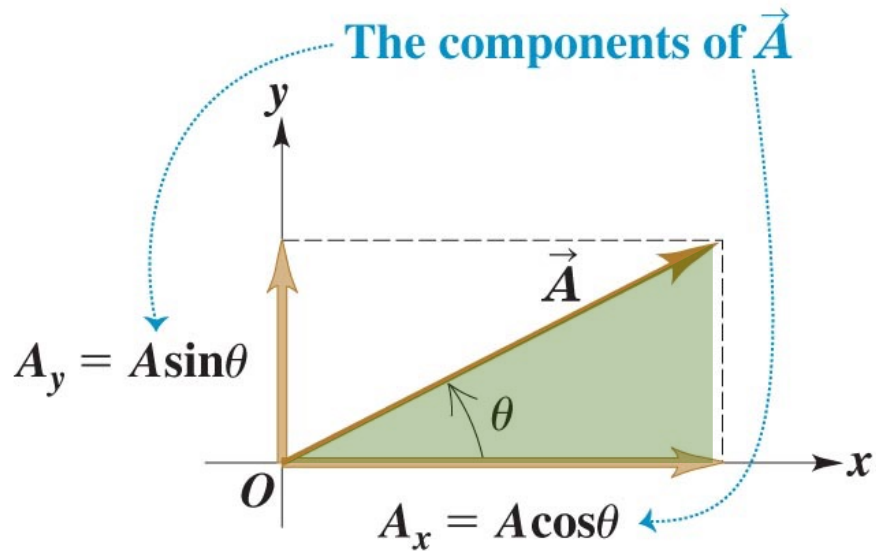
scalar



Components are the lengths covered along the axes (with signs).
Component vectors include directions along the axes.

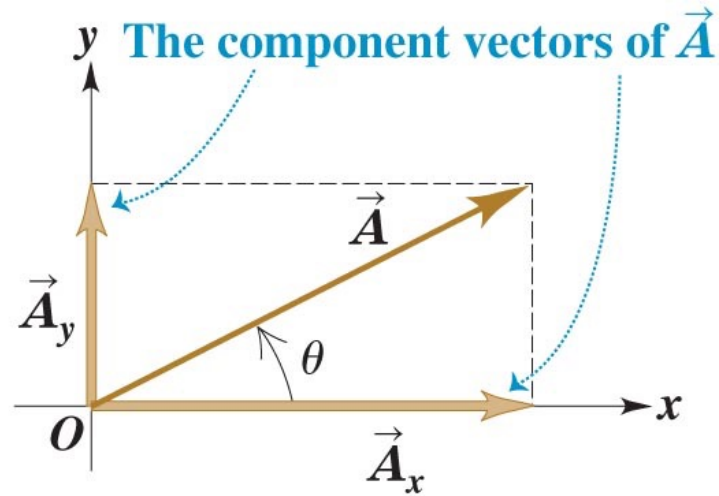


(a)

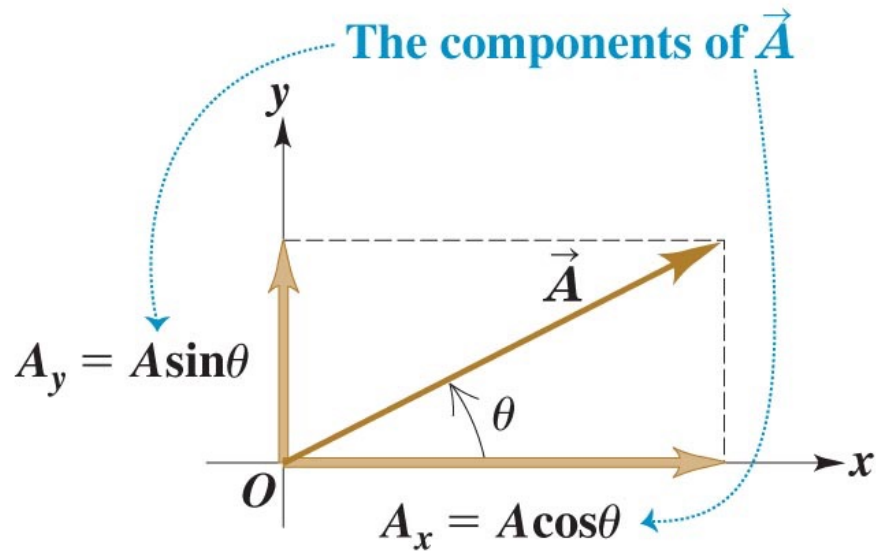


(b)

Note: can always construct right triangle whenever in doubt.



(a)

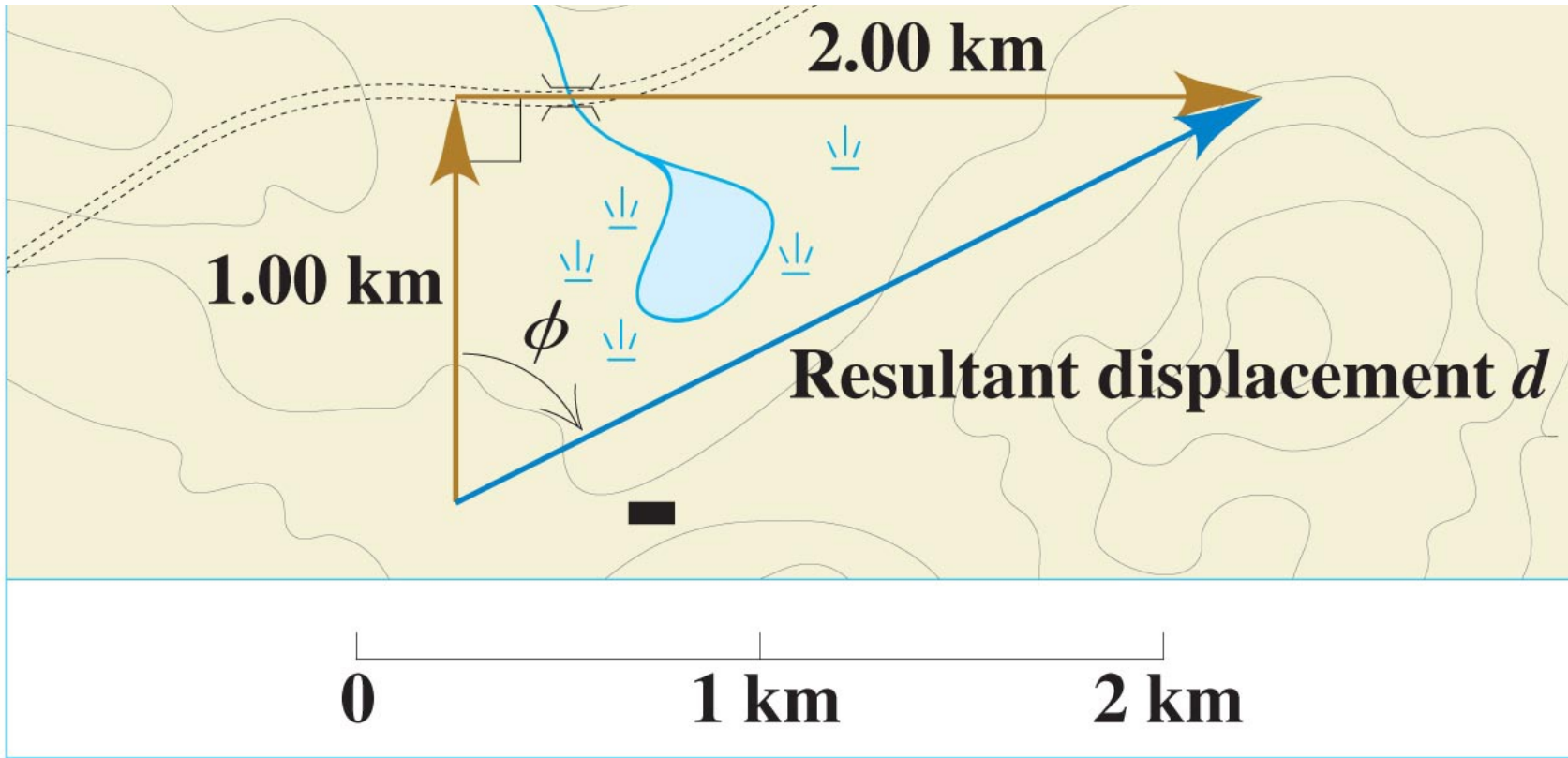


(b)

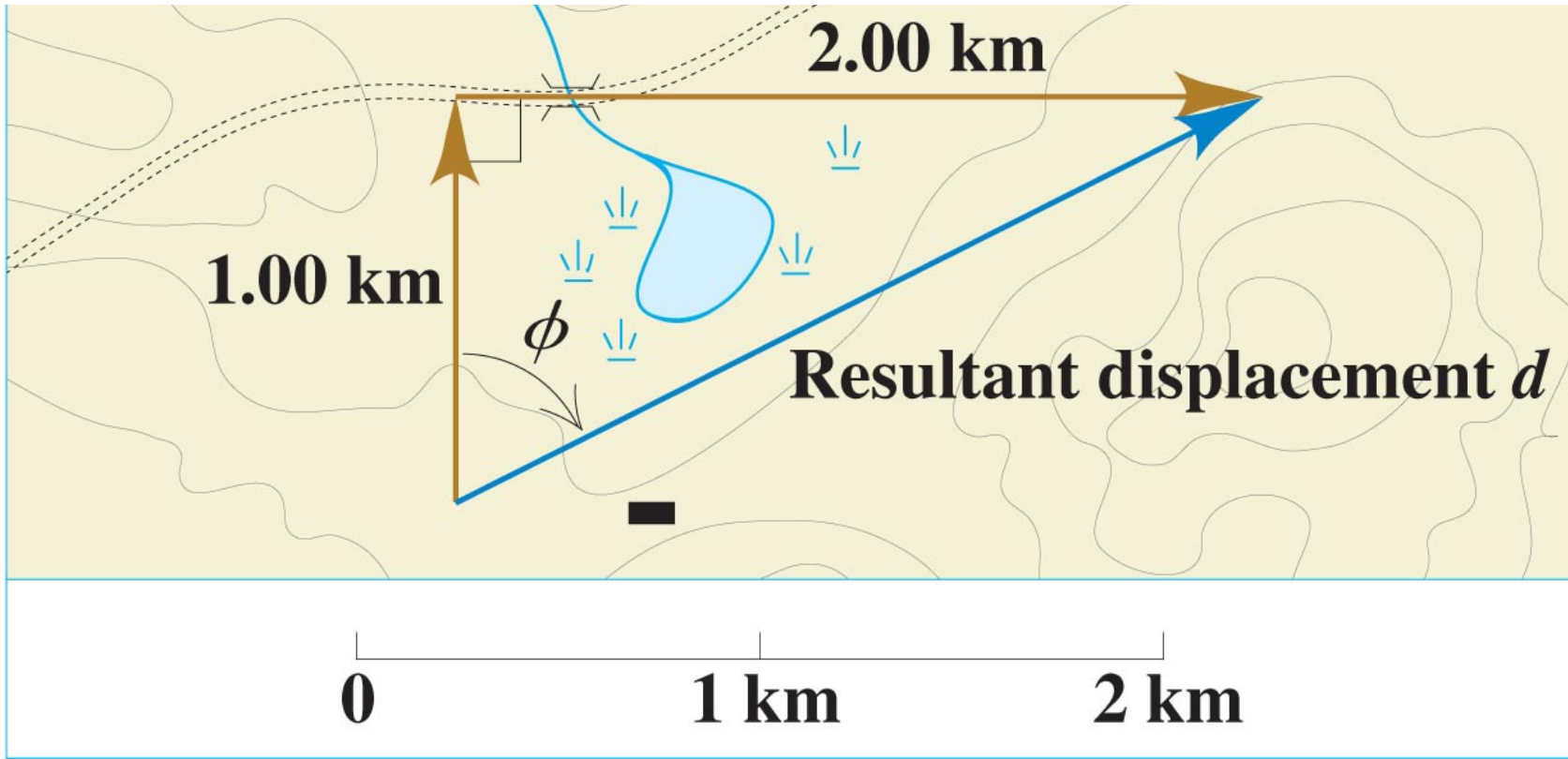
Also note:

$$A^2 = A_x^2 + A_y^2$$

(pythagorean theorem)



- Length of $d = ?$
 - 1.0 km
 - 2.0 km
 - 3.0 km
 - $\sqrt{5}$ km



- Length of $d = ?$

a) 1.0 km

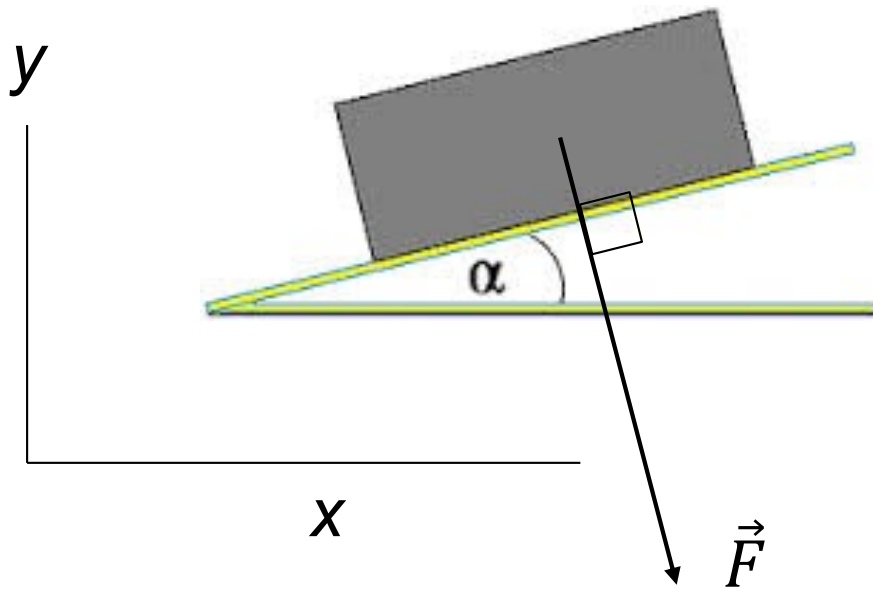
b) 2.0 km

c) 3.0 km

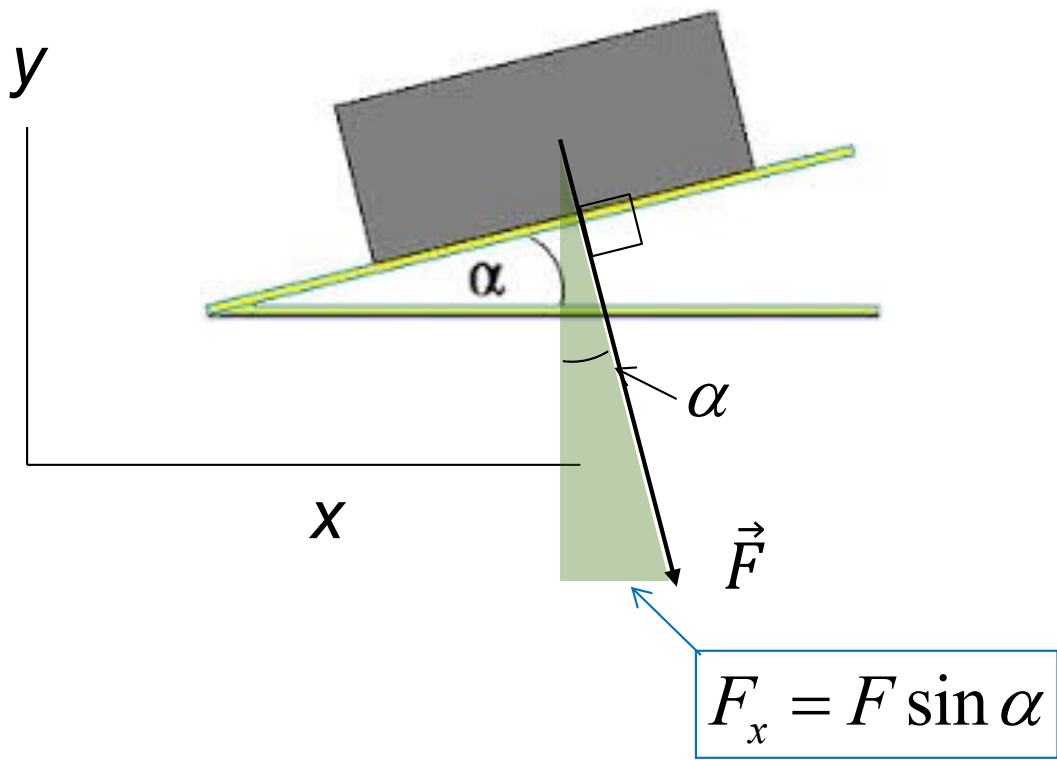
d) $\sqrt{5}$ km

also:

$$\phi = \arctan(2.00 / 1.00) \cong 63^\circ$$



- x component of \vec{F} ?



- x component of \vec{F} ?