ExamCafe

INDIVIDUALS' ENROLLMENT PROCESS
&
PRE-ENROLLMENT LEARNING

Interaction design and information design
recommendations by
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PPI Exam Cafe

Individuals' Enrollment Process
and Pre-enrollment Learning

Recommendations by John Boykin

Goals

1.   Clarify what the product is before users enroll.
2.   Make a lot of information readily accessible without requiring a lot of reading
3.   Streamline the process for users to start working

Scope

•   Focus on individuals preparing for the FE exam
•   Address only the steps individuals would go through prior to working their first problem
•   Anticipate the needs of students, teachers, and individuals preparing for the PE exam, but do not flesh out the UI for them

FE Versus PE

All pages mocked up in this design are intended for FE candidates. There will be a parallel set of counterpart pages for PE candidates. The PE pages will be based on these FE pages, but will differ somewhat in their specifics of content, pricing, and so on to suit the specific needs of PE candidates and what Exam Cafe has to offer them. There are basically two options to how those parallel paths could be structured:

1.   Have two separate links on the PPI home page: "FE Online Practice," and "PE Online Practice." People could then self-select at that point and go off to the FE Main Page or the PE Main Page, respectively.
2.   Have only a single "Online Practice" link on the PPI home page leading to a single generic Exam Cafe Main Page. That single generic Main Page would include a button "I'm a PE candidate" that PE candidates could click to take them to the PE Main Page.

The mockups in this package assume option 1.

Enrollment Basis

Currently PPI offers open access for periods of either 30 days or 90 days. The clock starts ticking the minute the user pays for the service. This approach creates a problem for users who do not begin using the service until sometime after they enroll and then discover that they have less time left than they expected. I would recommend the following:

•   Start the clock ticking the first time the user actually accesses a problem, rather than when they pay.
•   Consider basing a subscription not on elapsed calendar days, but on a number of visits. PPI would decide how best to define a visit for this purpose.

Pages

This design calls for the creation of the following pages.

PRIMARY PAGES

Main Page

The introduction to the service, explaining what it is, who it's for, and so on; with navigation links for further information and buttons to route users on to their appropriate enrollment page. They can get all the information they want about the service with a minimum of effort and without enrolling. The Main Page is reached either from the PPI home page, the "Exam Cafe Main Page" link in the nav, or an external link. Also, when users on authenticated pages click the "Logout" link in the nav, they are returned to the Main Page.

Enrollment Page

The screen where the user registers for the service. This is reached from either the "Enroll Now" link in the nav, or from the "Enroll me as an individual" button at the bottom of the Main Page.

First Authenticated Page

The page where the user decides which set of problems to begin working. After enrolling, reaching this page serves as the user's confirmation that enrollment was successful. Thereafter, it is the user's welcome page after logging in.

SECONDARY PAGES

FAQs Page

The page with all the details anyone wants to learn about the service. It includes links to important external pages such as to download the latest version of IE, MathPlayer, NCEES handbook to download or buy, and so on. The FAQs Page is accessible from the "FAQs" link in the nav; also, anchor links on the Main Page will take people to specific locations within the FAQs Page.

Quantity of Problems Page

Lists how many problems are offered in each topic area. This information is all on the surface, and all topic areas are shown on the same page. This approach minimizes the work users must do in order to get the information and lets them see all at once. This page is accessed from a link on the Main Page and from links located anywhere else PPI sees fit to put them (e.g., within the FAQs, the First Authenticated Page, etc.).

Free Test Drive Page

Offers prospective users five real working problems they can try out for free. PPI will of course use whatever terminology it chooses, but I recommend this term as one that users will readily understand. Since this page is a combination of marketing information and portions of the service itself, it is out of scope for this project and is therefore not mocked up in this package. This page is accessed from the "Free Test Drive" link in the nav on public pages and from a link within the content of the Main Page and wherever else PPI sees fit to put it (e.g., within the FAQs).

Extend Time Page
Enables users to buy additional time beyond what they bought originally. Because the content of this page depends on business decisions that PPI will need to make at a later date, I have not mocked up this page in this package. But it would be very simple, very concise. I would suggest a headline of "Extend Access to Exam Cafe." The smart content would say when the clock began ticking for this user, when this user's enrollment is scheduled to run out, and offer radio buttons for the various extension options that PPI chooses to offer. At the bottom would be a "Proceed to Checkout" button, just like on the Enrollment Page, that would take the user to the external payment page. This page would be accessed from a link on the First Authenticated Page. Because the user would be coming from a secure page, this page should likewise be secure, if only so users don't have to go through the nuisance (i.e., pop-up browser warnings) of going back and forth between secure and nonsecure environments.

Buy NCEES Reference Handbook
This may be either a new page or an anchor in an existing page elsewhere in the PPI site. It gives users all the information they need in order to decide whether they want to purchase the handbook and offers a link or button to enable them to make the purchase. It is accessed from a "By a printed copy ($XX)" link in the "Reference Book" box on the First Authenticated Page, the Enrollment Page, and wherever else PPI sees fit to place the link (e.g., in the FAQs). Because this page would be part of the broader PPI web site, it is out of scope for this project and is therefore not mocked up.

Terminology

In all the explanations of what Exam Cafe is all about, the two most important and telling words are "online practice." So until the proprietary term "Exam Cafe" has developed widespread recognition, I recommend leading with the generic words "online practice."

This is particularly important on the PPI home page. Home pages are never the place for proprietary terms that do not yet enjoy widespread recognition, because home pages don't usually have room to explain all of them. On the home page, "online practice" will be much more meaningful than "Exam Cafe" and thus much more likely to be clicked. If there is room, you could combine the two terms, i.e., "Online Practice: Exam Cafe." But if you must choose between the two terms, I recommend using "online practice."

Notes

I use the name "Todd Lampley" or just "Todd" to mean "the user."

The nav should never include a link to the page the user is already on.

MAIN PAGES
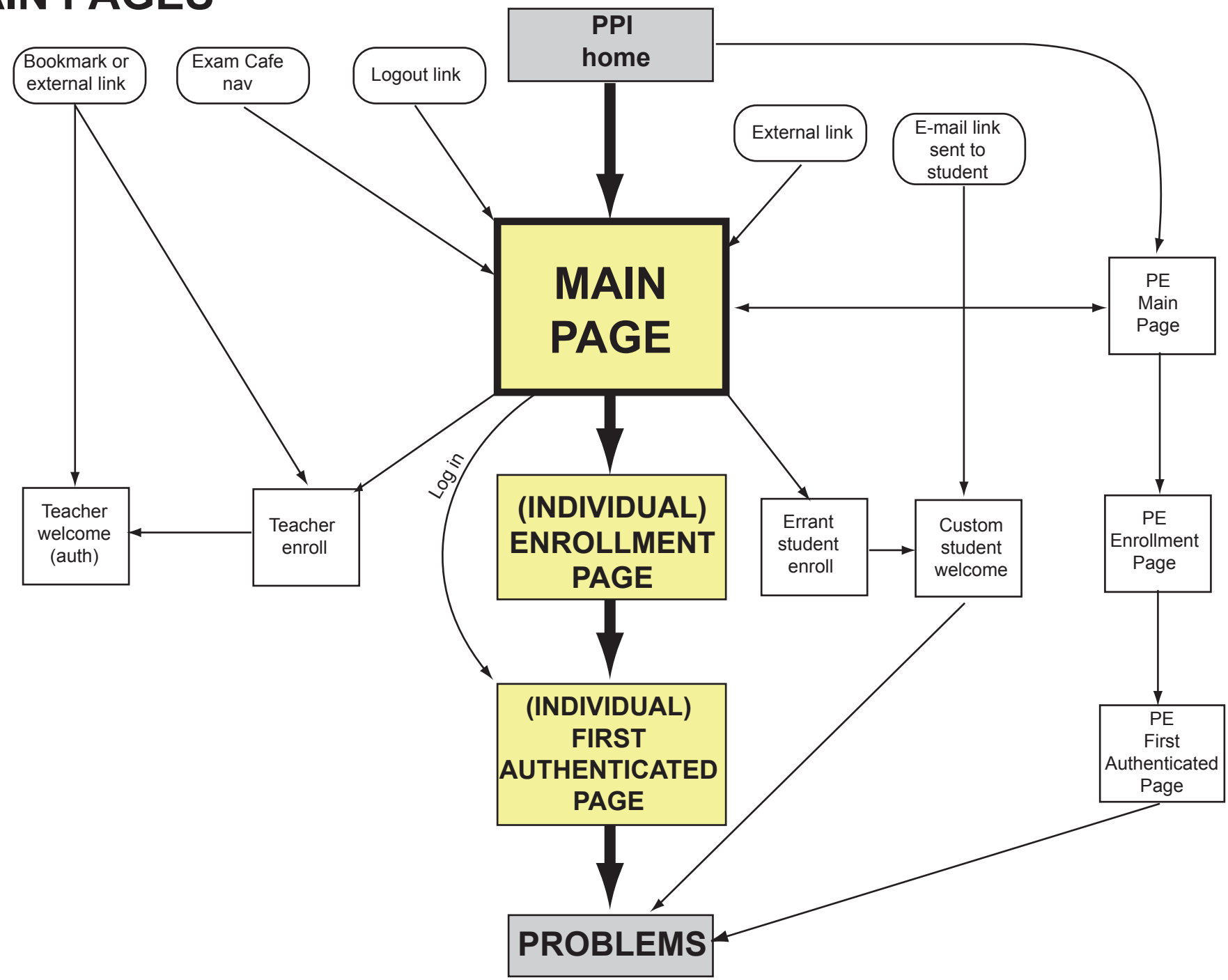
REACHING SECONDARY PAGES

PRIMARY PAGES

NAV

Main Page	Enrollment Page	First Authenticated Page

SECONDARY PAGES

Main PPI home page	Support	Sign in Problem	Forgot Password	FAQs	Free Test Drive	Quantity of Problems	Buy NCEES Reference Handbook	Extend Time
				NEW	NEW	NEW	NEW	NEW
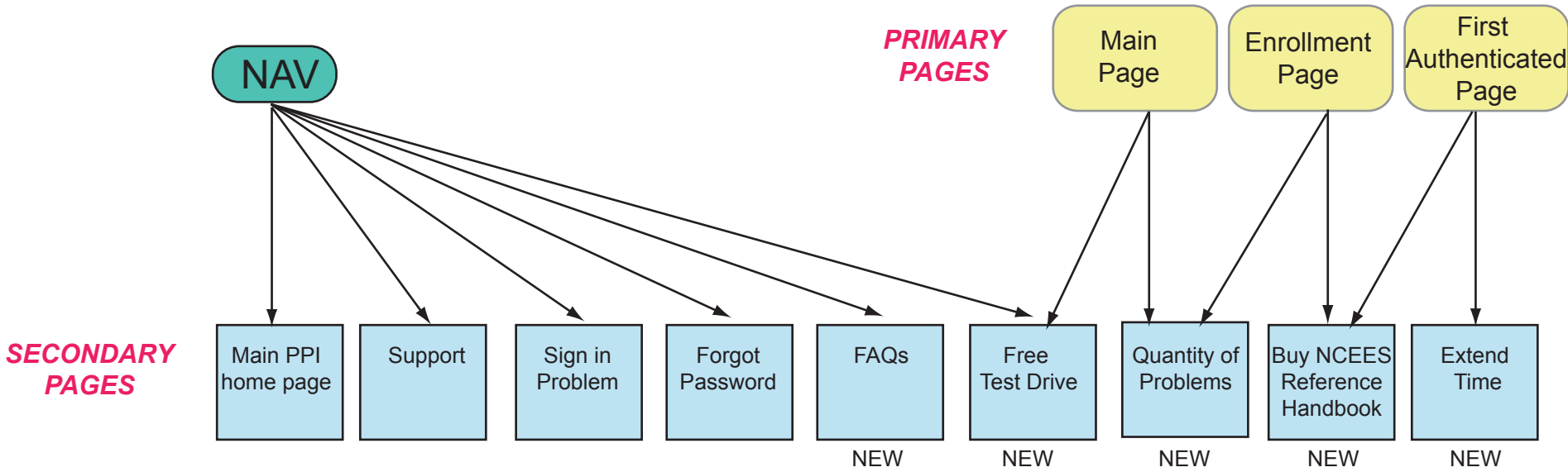
MAIN PAGE

This is the FE version of this page. The PE version will be just like this one, except for
-- wording changes to be supplied by PPI
-- the links FAQs, Enroll Now, and See how many problems ... each take Todd to PE counterparts of the pages specified here

Takes Todd to the Free Test Drive Page, where he can actually work five real working problems.

Takes Todd to FAQs Page for FE. (There will be a separate FAQs page for PE, which will be accessible from the PE version of this Main Page.)

Takes Todd to (individual) Enrollment Page.

Login box appears in the nav in all public pages. It will not appear on authenticated pages. Individuals, students, and teachers may all use the same login widget. The system parses their username and password to determine whether they are an individual, student, or teacher. It then routes the user to the appropriate authenticated page. Ideally, students will go directly to their custom page the via a link they receive in an e-mail from the teacher; but we should provide this contingency for errant students.

Cursor is already here the first time Todd comes to this page. Once he is enrolled, populate his username and put cursor in password box instead.

Once Todd has entered a valid username and password, clicking Go button takes him to the First Authenticated Page. If username and/or password is not valid, or if the combination is invalid, an error page says " The username or password you entered does not match our records. Please try again." That error page should include text entry boxes for username and password so Todd does not have to go somewhere else to login.

Takes Todd to the page containing PPI's current way of dealing with a forgotten password. Text explains that students must get their access code from their teacher. Text there also explains what teachers must do to get a reminder of their password.
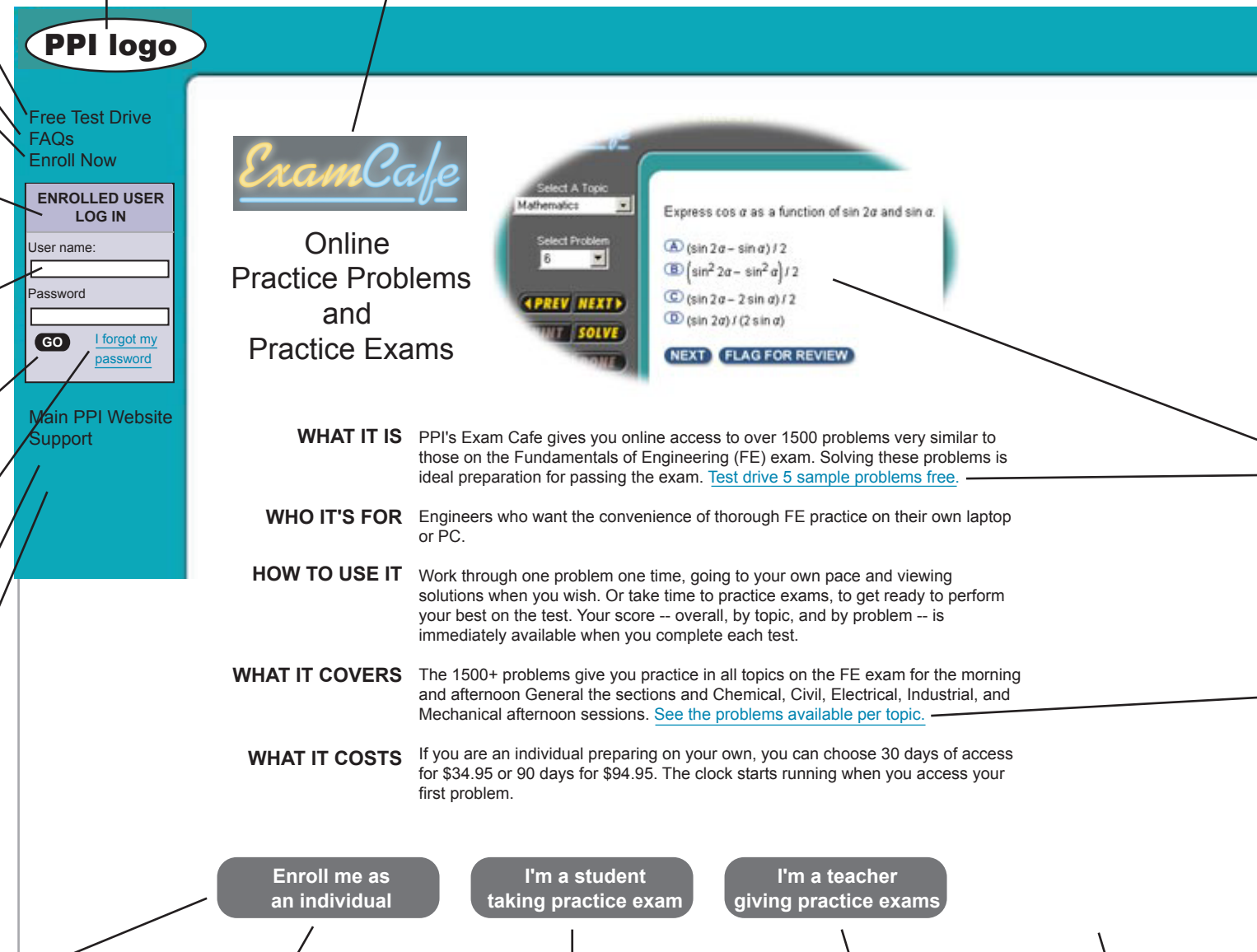
Main Page does not include a link in the nav for "Exam Cafe home page," since it would only take Todd to the page he is already on.

Logout link does not appear on public pages, since it would be meaningful only on authenticated pages.

When Todd first goes to the Main Page, the system checks behind-the-scenes for browser, MathPlayer, cookies, and JavaScript. If all those requirements are satisfied, then no technical requirements information would ever be presented to Todd. If Todd is using a Macintosh, the system will detect it. So when he clicks the "Enroll me as an individual" button on the Main Page, take him to a Mac Error Page instead of to the Enrollment page. The only content on that Mac Error Page would be "We detect that your using a Macintosh computer. Exam Cafe works only on a Windows computer, not on a Macintosh. Please come back on a Windows computer to enroll." All of the Main Page's nav would be present on the Macintosh Error Page.

PPI logo appears only on Exam Cafe Main page, to be sure the name PPI has a presence.

Exam Cafe logo appears inside the white area only on the main page. On every other page, it appears within the blue area in the upper left, where the PPI logo is on this page.

PPI logo

Free Test Drive
FAQs
Enroll Now

ENROLLED USER LOG IN
User name:
Password
GO   I forgot my password

Main PPI Website
Support

ExamCafe

Online
Practice Problems
and
Practice Exams

Select A Topic
Mathematics
Select Problem
6

◄PREV NEXT►
SOLVE

Express cos α as a function of sin 2α and sin α.

(A) $(\sin 2α − \sin α) / 2$
(B) $\left(\sin^2 2α − \sin^2 α\right) / 2$
(C) $(\sin 2α − 2 \sin α) / 2$
(D) $(\sin 2α) / (2 \sin α)$

NEXT   FLAG FOR REVIEW

WHAT IT IS PPI's Exam Cafe gives you online access to over 1500 problems very similar to those on the Fundamentals of Engineering (FE) exam. Solving these problems is ideal preparation for passing the exam. Test drive 5 sample problems free.

WHO IT'S FOR Engineers who want the convenience of thorough FE practice on their own laptop or PC.

HOW TO USE IT Work through one problem one time, going to your own pace and viewing solutions when you wish. Or take time to practice exams, to get ready to perform your best on the test. Your score -- overall, by topic, and by problem -- is immediately available when you complete each test.

WHAT IT COVERS The 1500+ problems give you practice in all topics on the FE exam for the morning and afternoon General the sections and Chemical, Civil, Electrical, Industrial, and Mechanical afternoon sessions. See the problems available per topic.

WHAT IT COSTS If you are an individual preparing on your own, you can choose 30 days of access for $34.95 or 90 days for $94.95. The clock starts running when you access your first problem.

Enroll me as an individual   **I'm a student taking practice exam**   **I'm a teacher giving practice exams**

Takes Todd to Free Test Drive page, where he can try out five real working problems.

Takes him to Quantity of Problems page.

Takes him to (individual) Enrollment page.

Takes errant student to generic student sign in page. This button is just a contingency for students who come through the main page rather than clicking a link to their custom page sent in an e-mail by their teacher.

Takes teacher to page that explains how teachers can use Exam Cafe and lets them sign up.

Optional: "I'm a PE candidate" button, which takes Todd to the PE Main Page.

ENROLLMENT PAGE

This is the FE version of this page. The PE version will be just like this one, except for
-- wording changes in intro
-- wording changes in "Reference Book" box (MERM)

See Main Page for comments on nav. Note that Enrollment Page nav does not include "Enroll Now" link but does include "Exam Cafe Home" link.

Cursor is already in "first name" text entry box when this page opens. If, however, Todd has already personalized the site, populate the "first name," "last name," and "e-mail address" text entry boxes with the information that we already have. Todd may make any changes he wants in that information. If we populate fields, then the cursor should start off automatically in the "create a username" box, since it would be the next box in the series the Todd can be expected to follow.

If there are any restrictions or rules on what a username or password can or must be, then add a line of text under the username box and the password box so Todd knows in advance what those guidelines are. This saves him the nuisance of getting an error message for not having known a rule that we hadn't told him.

No radio button is preselected.

When Todd first goes to the Main Page, the system checks behind-the-scenes for browser, MathPlayer, cookies, and JavaScript. If all those requirements are satisfied, then no technical requirements information would ever be presented to Todd. So the technical requirements section of this page would simply be omitted. If, however, the system discovers that any of those requirements are not met, then it would present here a message about ONLY that item(s). This way Todd never has to think about any technical requirement that he satisfies. This mockup shows what he would see if this computer fails the browser, MathPlayer, cookies, AND JavaScript tests. If it failed only the MathPlayer test, for example, then only the MathPlayer line would appear here.

It is important to include the word "individual" in the headline to differentiate this page from the counterpart pages for teachers and students.

Takes user to Teacher Enrollment page.

Takes errant students to Student Enrollment page.

Takes Todd to NCEES page where he can buy the handbook, not just to their home page. This will require occasionally making sure the link is still good, but will be much more convenient for Todd than being taken to a home page that won't help him much.

Anchor link to specific spot in PPI web site where handbook is described and can be ordered, not just to PPI home page.

In the unlikely event that Todd is using a Macintosh instead of the Windows computer, there is no point having him go through the motions of trying to enroll. The system will have detected on the Main Page that he is using a Mac. So when he clicks the "Enroll me as an individual" button on the Main Page, take him to a Mac Error Page instead of to this page. The only content on that Mac Error Page would be "We detect that your using a Macintosh computer. Exam Cafe works only on a Windows computer, not on a Macintosh. Please come back on a Windows computer to enroll." All of the Main Page's nav would be present on the Macintosh Error Page so he can continue to learn about the service if he wishes.

Takes Todd to the payment page where he enters his credit card information. If Todd clicks "proceed to checkout" without having completed a box or selected an enrollment time on this page, then an error message would be added to this page. Redraw the page without losing any of the work that Todd did complete on the page. The idea is to spare him the trouble of having to do work a second time. The error message should be in bold red type and should appear as close to the problem spot as possible. If you can make that error message blink twice, do. But do not let it blink more than twice.

Each "Explain" link takes Todd to the appropriate spot inside the FAQs that discusses MathPlayer, cookies, etc.

Takes Todd to MathPlayer page where he can download the plug-in.

Takes Todd to Microsoft's page to download latest version of IE.

ExamCafe

Free Test Drive
FAQs

ENROLLED USER LOG IN

User name:
[_____]

Password
[_____]

[GO]   I forgot my password

Exam Cafe Home
Main PPI Website
Support

Enroll in Exam Cafe: Individual

This page is ONLY for individuals who are preparing for the exam on their own.
If you are a teacher preparing students to take the exam, enroll on the teacher page.
If you are a student whose teacher assigned you to come to Exam Cafe, enroll on the student page.

All items are required.

First name: [_____]

Last name: [_____]

E-mail address: [_____]

Read PPI's privacy policy

Create a user name: [_____]

Create a password: [_____]

Type password again: [_____]

Enroll me for: ○ 30 days for $34.95
                ○ 90 days for $94.95

REFERENCE BOOK

The only reference you should use while working these problems is the latest edition of the NCEES' Reference Handbook, because it is the one you will use during the actual FE exam.

Download a free electronic copy (17.5 MB)
Buy a printed copy ($XX)

TECHNICAL REQUIREMENTS

We detect that your PC does **NOT** have the following, which are required to use Exam Cafe:

Internet Explorer 5.5 or higher for Windows   Explain   Download for free
MathPlayer plugin   Explain   Download for free
Cookies & JavaScript enabled   Explain

Proceed to Checkout

Each page should have its own unique headline. The headline should appear in the white area where it is more likely to be noticed that it is currently up in the blue area.

Takes Todd to first problem in the subject area he selected in the listbox beside it. If he did not make any selection in the listbox, clicking Start button takes him to problem one of the subject area that comes first in the alphabet.

No sign in widget, since Todd is already signed in. No links for "Free Test Drive" or "Enroll Now" since neither applies to Todd at this point.

Listbox lets Todd select subject area he wants to browse. PPI determines list of options to be offered in listbox. A selection in the listbox has no effect until he clicks Start or Resume.

Link appears only after Todd has answered problems. Resets whatever answers Todd has given previously in browsing and resets his progress statistics to zero. After he clicks this link, it is replaced with a message (not a link): "Your previous answers have been cleared." Link reappears after he answers problems again.

Listbox lets Todd specify the discipline in which he wants to take a timed exam. It has the same effect as making that choice with the listbox inside the problems area. It has no effect until he clicks Start or Resume. PPI determines list of options to be offered in listbox.

Clicking Start button takes Todd to timed exam in whatever discipline he specified in the listbox. If he does not specify any discipline in the listbox, the first page inside the problems area will ask him to specify, as it does now.

These are the same statistics PPI offers now, but with the addition of a "% of answers correct" line. Values go to the left, labels go to the right so that the presentation takes up less space.

Clicking this link changes the presentation of statistics as PPI does now when Todd asks for breakdown by topic.

Progress statistics appear only when and to the extent they are pertinent. So, for example, the first time Todd comes to this page, he has not done any problems before so he has no progress to report. Therefore this progress section would not appear at all and the wording in the text at the top would say your records "will be" shown below. If later Todd has only done some browsing, then only browsing statistics would appear here. If instead he is done only one timed exam, then only the statistics for that one timed exam would appear here.

Each time Todd comes to this page, the number of days remaining in his enrollment appears here.
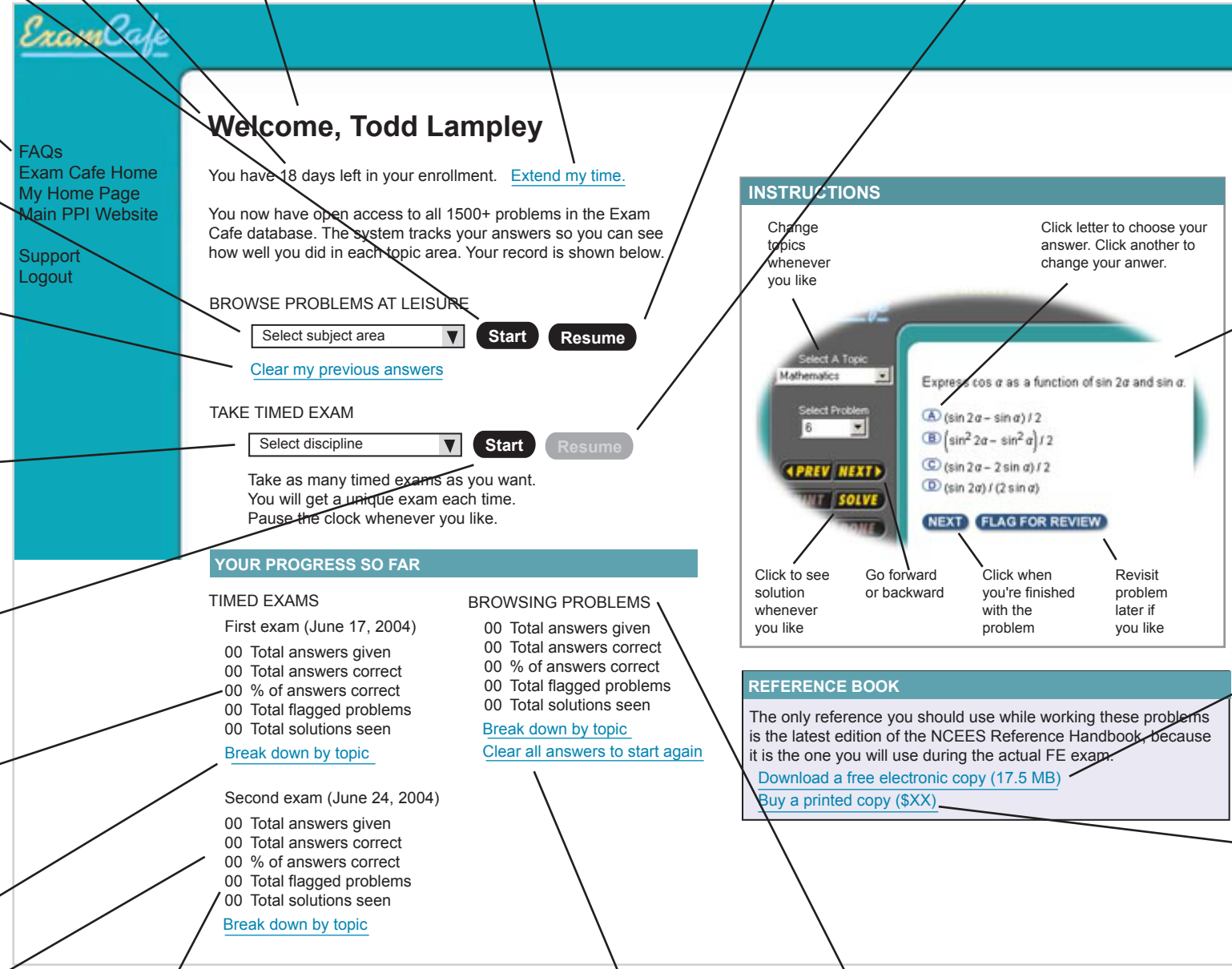
The first time Todd comes here after successfully enrolling, headline says "You Are Now Enrolled, [name]". This serves as his confirmation that registration was successful. Every time from then on, the headline says "Welcome, [name]."

Link takes Todd to page where he can specify how much more time he would like to buy. (That page is not mocked up in this project.) From there he would go to the payment page.

Lets Todd pick up where he left off last time he was browsing. Takes him to the next problem he would have encountered in whatever sequence he was in last time. If this is his first visit, or if there is otherwise no sequence for him to resume, this button would be grayed out.

Lets Todd pick up where he left off in his previous timed exam. If he does not have a partially completed exam waiting for him to finish, this button would be grayed out.

These should be all the instructions needed. The screen shot was done in Photoshop, and was assembled with the callouts in Illustrator on the screen mockup. The PPI art department will be able to update this as necessary.

Takes Todd to NCEES page where he can buy the handbook, not just to their home page. This will require occasionally making sure the link is still good, but will be much more convenient for Todd than being taken to a home page that won't help him much.

Anchor link to specific spot in PPI web site where handbook is described and can be ordered, not just to PPI home page.

Whichever kind of activity Todd does first (browsing or timed exam) appears in left column. Statistics for the other kind of activity appear in the right column only once he does that. This way we never have statistics in only the right column with nothing in the left. This mockup shows what he would see if he first does a timed exam and then does some browsing. Each timed exam he takes is identified as first, second, third, and so on, along with the date on which he began taking it.

Clicking this resets all statistics to zero for browsing problems. Page redraws.

Note the term "Browsing problems," which should be more self-explanatory than the current term "open access," particularly now that everyone gets open access.

Exam Cafe

FAQs
Exam Cafe Home
My Home Page
Main PPI Website

Support
Logout

Welcome, Todd Lampley

You have 18 days left in your enrollment.   Extend my time.

You now have open access to all 1500+ problems in the Exam Cafe database. The system tracks your answers so you can see how well you did in each topic area. Your record is shown below.

BROWSE PROBLEMS AT LEISURE

[Select subject area ▼] **Start** **Resume**

Clear my previous answers

TAKE TIMED EXAM

[Select discipline ▼] **Start** **Resume**

Take as many timed exams as you want. You will get a unique exam each time. Pause the clock whenever you like.

YOUR PROGRESS SO FAR

TIMED EXAMS

First exam (June 17, 2004)

00 Total answers given
00 Total answers correct
00 % of answers correct
00 Total flagged problems
00 Total solutions seen

Break down by topic

Second exam (June 24, 2004)

00 Total answers given
00 Total answers correct
00 % of answers correct
00 Total flagged problems
00 Total solutions seen

Break down by topic

BROWSING PROBLEMS

00 Total answers given
00 Total answers correct
00 % of answers correct
00 Total flagged problems
00 Total solutions seen

Break down by topic
Clear all answers to start again

INSTRUCTIONS

Change topics whenever you like

Click letter to choose your answer. Click another to change your anwer.

Select A Topic
Mathematics

Select Problem
6

Express cos α as a function of sin 2α and sin α.

(A) $(\sin 2\alpha - \sin \alpha)/2$
(B) $(\sin^2 2\alpha - \sin^2 \alpha)/2$
(C) $(\sin 2\alpha - 2\sin \alpha)/2$
(D) $(\sin 2\alpha)/(2\sin \alpha)$

◄PREV NEXT►
SOLVE
NEXT FLAG FOR REVIEW

Click to see solution whenever you like

Go forward or backward

Click when you're finished with the problem

Revisit problem later if you like

REFERENCE BOOK

The only reference you should use while working these problems is the latest edition of the NCEES Reference Handbook, because it is the one you will use during the actual FE exam.

Download a free electronic copy (17.5 MB)
Buy a printed copy ($XX)

FAQs PAGE

This is the generic design for the FAQs page. There will be separate FAQs pages for individuals, students, and teachrrs (and perhaps for PE candidates), each with content appropriate to its category of users. Each will be accessible only from pages tailored to its category of users. Some content may reappear in multiple versions of the page along with content unique to each version. In each case, PPI will provide the text.

This FAQs page should be the same design as for the Exam Cafe problem contributor FAQs page from 2003.

Each question appears in black type, but turns blue and underlined when Todd mouses over it.

No FAQs link is included in the nav, since Todd is already on the FAQs page.

Questions are grouped into categories to be determined by PPI. Category headings are in all capital letters and colored type to stand out. They break up the list of questions at the top of the page and the answers lower in the page.

This link, which functions the same as the browser's Back button, would appear at the end of the list of questions and again at the end of each category of answers.

There should be separate questions about the requirements for browser, MathPlayer, cookies, and JavaScript. Anchor links on the Main Page would take Todd to these answers on this page.

-- The answer about the browser requirement would include a link to the page in Microsoft's site that lets you download the latest version of IE.

-- The MathPlayer answer would include a link to the external site at which Todd would download MathPlayer. It may, if necessary, also include a table of the test equation art, with the GIF of the equation above and the MathPlayer version of the equation (or gibberish, as the case may be) below. The two will be easier to compare when they're stacked than when they are side-by-side.

-- The cookies and JavaScript answers would each just include information saying specifically how Todd would turn them on and encouraging him to print the instructions to refer to as he works. These answers should appear at or close to the top of the FAQs so that they will be on the first page he prints out.

ExamCafe

Free Test Drive
Enroll Now

ENROLLED USER LOG IN

User name:

Password

GO   I forgot my password.

Exam Cafe Home
Main PPI Website
Support

Frequently Asked Questions

FIRST CATEGORY HEADING
First question. Black type that turns blue and underlined on rollover.
Second question. Include ones about IE 5.5, MathPlayer, cookies and JS.
Third question. Those are anchor links from main page.
Fourth question. Include equations image test with MathPlayer question.

SECOND CATEGORY HEADING
First question, black type that turns blue and underlined on rollover.
Second question, and a very good one it is.
Third question and so on you will notice the pattern continuing.
Fourth question, black type that turns blue and underlined on rollover.
Fifth question, and a very good one it is.
Sixth question and so on you will notice the pattern continuing.

THIRD CATEGORY HEADING
First question, black type that turns blue and underlined on rollover.
Second question, and a very good one it is.

Return to the page you came from

FIRST CATEGORY HEADING

First question. Black type that turns blue and underlined on rollover.

Answer to this question. Notice that we are repeating category headings and questions. The answer will go on however long it may be. I'm just making up dummy text because I don't really have questions or answers but I need to have some gray matter on the page to illustrate concept.

Second question. Include ones about IE 5.5, MathPlayer, cookies and JS.

Answer to this question. Notice that we are repeating category headings and questions. The answer will go on however long it may be. I'm just making up dummy text because I don't really have questions or answers but I need to have some gray matter on the page to illustrate

Third question. Those are anchor links from main page.

Answer to this question. Notice that we are repeating category headings and questions. The answer will go on however long it may be. I'm just making up dummy text because I don't really have questions or answers but I need to have some gray matter on the page to illustrate .

Return to the page you came from

QUANTITY OF PROBLEMS PAGE

This is the FE version of this page. The PE version will be just like this one, except for -- different headings, subject matter categories, and quantities, as appropriate for PE

Start with morning, then afternoon general, then run the headings in alphabetical order left to right, then top to bottom.

Put the quantities in the left column and the labels in the right column, with minimal space between them. This will make the information easier to read while saving space. Avoid any need to scroll the page horizontally.

ExamCafe

Free Test Drive
FAQs
Enroll Now

ENROLLED USER LOG IN

User name:

Password

GO | I forgot my password

Exam Cafe Home
Main PPI Website
Support

Quantity of Problems Available per Topic

FE MORNING

33	Chemistry
20	Computers
25	Dynamics
46	Electric Circuits
15	Eng. Economics
19	Ethics
25	Fluid Mechanics
24	Mat'l Sci./Struct. Of Matter
75	Mathematics
24	Mechanics Of Materials
38	Statics
33	Thermodynamics
377	TOTAL

FE AFTERNOON: GENERAL

10	Chemistry
5	Computers
13	Dynamics
17	Electrical circuits
9	Engineering economics
9	Ethics
11	Fluid mechanics
6	Mat'l Sci./Struct. Of Matter
35	Mathematics
12	Mechanics of materials
18	Statics
18	Thermodynamics
163	TOTAL

FE AFTERNOON: CHEMICAL

33	Chemistry
20	Computers
25	Dynamics
46	Electric Circuits
15	Eng. Economics
19	Ethics
25	Fluid Mechanics
24	Mat'l Sci./Struct. Of Matter
75	Mathematics
24	Mechanics Of Materials
38	Statics
33	Thermodynamics
377	TOTAL

Put a horizontal line just above the total to represent the fact that we are adding up the column of numbers.

FE AFTERNOON: ELECTRICAL

33	Chemistry
20	Computers
25	Dynamics
46	Electric Circuits
15	Eng. Economics
19	Ethics
25	Fluid Mechanics
24	Mat'l Sci./Struct. Of Matter
75	Mathematics
24	Mechanics Of Materials
38	Statics
33	Thermodynamics
377	TOTAL

FE AFTERNOON: INDUSTRIAL

10	Chemistry
5	Computers
13	Dynamics
17	Electrical circuits
9	Engineering economics
9	Ethics
11	Fluid mechanics
6	Mat'l Sci./Struct. Of Matter
35	Mathematics
12	Mechanics of materials
18	Statics
18	Thermodynamics
163	TOTAL

FE AFTERNOON: MECHANICAL

33	Chemistry
20	Computers
25	Dynamics
46	Electric Circuits
15	Eng. Economics
19	Ethics
25	Fluid Mechanics
24	Mat'l Sci./Struct. Of Matter
75	Mathematics
24	Mechanics Of Materials
38	Statics
33	Thermodynamics
377	TOTAL

Abbreviate "Material Science/Structure of Matter" so it is not so much longer than the others. If you need the space, this will also let you fit more sets of topics side-by-side.

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