State Farm Insurance Companies

Catastrophe

Fire Independent Adjuster Training

Estimatics Study Guide
Catastrophe – Estimatics Study Guide

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Administration Information

The Catastrophe Fire Independent Adjuster Estimatics Study Guide is designed to be a self-study aid. It provides information regarding particular State Farm estimating and pricing practices and procedures.

The guide also includes exercises and answer keys so you can practice the estimating and pricing skills discussed in the text. The exercises may be photocopied as needed.

A copy of the Catastrophe Fire Independent Adjuster Training Price List and the other study materials (pens, pencils, paper, etc.) are needed to complete this training.
Sections of the Price List

- Table of Contents By Category (List of categories used in the Price List)

Note: A category is similar to a building trade; however, a single trade may include the work of more than one category. For example, there is an electrical (ELE) category and a lighting (LIT) category. Both are performed by the same tradesperson, an electrician.

- Price List Labor Components (Labor rates by trade)
- List of Abbreviations (Descriptions for abbreviations used in the Price List)
- Price List (Categories and specific selector codes within each category)

Note: A selector code refers to a specific item within a category.

The prices used in this list are for training purposes only.

The Table of Contents by Category and the Price List are taken from Xactimate® estimating software and are organized alphabetically by category code. Within each category are many selector codes. These selector codes are usually arranged alphabetically. If numerical selector codes are included in a category, they usually precede an alphabetical code.

Example: DRY is the category for drywall. 1/2 is the selector code for 1/2” drywall. 1/2 appears at the beginning of the DRY category. It is followed by other numerical codes including several for 5/8” drywall. Then the list continues with alphabetic selector codes.

Item Selection Process

There are four probable scenarios:

- You know the category and the selector code. Go directly to the Price List and find the price for the item.
- You know the category, but not the selector code. Go to the correct category in the Price List to review details (such as the Quality statement) to help pinpoint the correct item.
- You don't know the category or the selector code. Go to the Table of Contents by Category and select the category that fits best. Then go to the correct category in the Price List to review details (such as the Quality statement) to help pinpoint the correct item.
- There is no Xactimate® price available. Research the price locally.
Using the Price List

Information included in the Price List for each item:

- **Category code**  
  Similar to a trade breakdown.

- **Selector code**  
  Identifies a specific item within a category. For example, DRY is the category for drywall and 1/2 is the selector code for 1/2" drywall - hung, taped, floated, ready for paint.

- **Activity Code**  
  This is a default code used by the computer software. The most common codes are "&" which means "remove and replace" and "+" which means "replace". Disregard this column for this training.

- **Description**  
  Briefly describes the selector code (also called "line item").

- **Unit Calculation**  
  The unit of measure (for example, SF stands for square feet).

- **Replace**  
  The unit cost to replace only.

- **Remove**  
  The unit cost to remove only.

- **Reset**  
  The unit cost to detach, store on site, and reinstall.

- **Remove & Replace**  
  The unit cost to remove an item and replace it with a new item.

- **A more detailed description of materials**

- **A quality statement**

Building items vary in size and quality. The “Item Information” included in the Price List further defines the size and quality.

Follow along in your Price List for the following example:

**Example 1**  
Assume a house was destroyed by fire. You need to replace a 4'-0" x 4'-6" double-hung wood window that has insulated glass, aluminum cladding on the outside and Low E treatment of the glass. (Underlined items are key items used in this exercise.)

To find the category, selector code, and unit price for this window do the following:

- **Start by looking in the Table of Contents by Category in the Price Book.**  
  Near the bottom of the list, is the code WDW which stands for "Windows - Wood". Since our window is a wood window, turn to WDW in the Price List.

**Note:**  
To help you page through the Price List, category codes are tabbed.

- **In the WDW category, look for the selector code that stands for a "double hung" window.**  
  Since double hung starts with a "d", begin by looking for codes starting with "d". Remember, the list is alphabetical by selector code.

In this case, "D" does stand for "double hung". However, there are several codes for double hung windows.
Next, look at the Item Information for WDW D. First, the size of a WDW D window is 10 - 15 SF. Our window is 4 x 4.5 or 18 SF and does not fall in this range.

Greater than (>) and less than (<) symbols are added to a code to change the size it represents. ">" makes an item bigger, and "<" makes it smaller.

Go down the list until you find the code "D>". The size range for D> is 16 - 21 SF. Our window is 18 SF and falls in that range.

So far then, our code is WDW D>. Does this code have all the other window characteristics we need?

• Our window has insulated glass. The Item Information for WDW D> says it is a double glazed window. That is the same as insulated glass, so this code meets that criteria.

• Our window also has aluminum cladding. The Item Information for WDW D> has the cladding we seek, so this code continues to meet our criteria.

• Our window has Low E treatment of the glass. The Item Information for WDW D> does not mention Low E treatment, so you can assume it does not have it.

You must now look for a code that does include the Low E treatment cladding.

Plus (+) and minus (-) signs are added to a code to change the quality it represents. "+" increases quality and "-" decreases quality. The code without a "+" or "-" is considered "average quality".

Example: LIT CHAN is an average grade chandelier. LIT CHAN+ is a high grade chandelier.

• Move up one level of quality by looking for a code that includes a "+" sign.

Go to WDW D>+ and look at the Item Information for that window.

It says it has Low E treatment. It also is the right size. **WDW D>+** is the correct code.

• Since the house was destroyed by fire, you only need to replace the window (not remove and replace).

Go to the "Replace" column to find the correct price. It is **$424.88**.

**Note:** A common and costly error is to remove and replace an item that should only be replaced.

Things other than "+" or "-" can also change the quality. For example, adding an "H" to a trim code changes it to "hardwood," which generally increases the price.

**Suggestion:** When you think you have the correct selector code, look at the Item Information code one grade above and the code one grade below to verify your selection as the best choice for the item being estimated. Some code Item Information descriptions are very similar and a little closer look may influence your decision.

**Basic Estimating Considerations**

Estimating is not an exact science. There are several approaches to scoping and estimating. Below are some of the scoping practices that we encourage.
Deducting Openings in Walls and Ceilings

When estimating repairs to walls and ceilings, we must consider other materials or items that share the same space or area. For example, if you are estimating to paint a wall that has a window, you must consider the surface area of the window as an interruption of the wall surface area being painted. We refer to this single and continuous interruption as an "opening" in the material being estimated.

When deducting openings, use common sense and good judgment. Consider deducting openings larger than a standard 30" x 6'8" exterior door.

When measuring trimmed openings such as doors and windows, measure from inside jamb to inside jamb.

A few examples are: (Remember to consider size relative to a standard 3’0” x 6’8” exterior door)
- Deducting a 5’ x 5’ window opening while estimating wallpaper square footage.
- Deducting a 6’ x 6’ area of wallpaper while estimating painting.
- Deducting window and door openings while estimating siding or drywall.

Other types of openings could be:
- A fireplace and mantle
- Kitchen cabinets or a tile backsplash
- Built-in bookcases
- Garage doors

Determining the size of openings in walls and ceilings

- Area of a square or rectangle: \( A = \text{Base} \times \text{Height} \)
- Area of a triangle: \( A = \frac{1}{2} \times \text{Base} \times \text{Height} \)
- Area of a trapezoid: \( A = \frac{(\text{Base}_1 + \text{Base}_2)}{2} \times \text{Height} \)
- Area of a circle: \( A = \pi r^2 \) (\( \pi = 3.14 \) and \( r = \text{radius of the circle} \))

Deducting Openings in Trim

"Openings" in regard to trim, such as baseboard, chair rail, etc., simply refers to any space where there is no trim. As with walls and ceilings, use common sense and good judgment. Again, consider deducting openings larger than a standard 3’0” x 6’8” exterior door.

All openings for trim should be subtracted from the total (before openings) for that trim. In a very cut-up room, another method is to measure only the trim that is there. This may be quicker than taking the total (before openings), then subtracting openings. Either method will work.

A common example is deducting for a doorway opening when estimating baseboard. Assuming the door is greater than 3’0” x 6’8”; add up the total Linear Feet (LF) of walls in the room, including the door. To get the adjusted amount, subtract the width of the door from the total.

Assume this same room also had a closet and your trim total before openings included the LF of wall inside the closet. To get the adjusted LF of baseboard, you must subtract the entry door as described and also subtract both sides of the closet door (when greater than 3’0” x 6’8”) because both sides were added into the gross LF amount.
Estimating Doors
One method of estimating doors, particularly in new construction, is to include the door and all related items in the room into which the door opens. Since you have already addressed all the damage to the door from the room into which it opens, you can ignore the door when you get to the room on the other side of the door.

Door operations may include:
- Removing and replacing a door
- Painting a door (both sides if necessary)
- Staining and finishing a door (both sides if necessary)
- Detaching and resetting, or removing and replacing a lockset (or deadbolt)
- Painting an opening (both sides if necessary)
- Staining and finishing an opening (both sides if necessary)

There are other methods of scoping damage to doors, but the one mentioned above works well.

Painting Around Openings and Trim
Professional painters seldom mask the perimeter of rooms when painting ceilings or mask floors when painting walls or ceilings. They do spread drop-cloths and protect furnishings, but seldom mask surfaces not to be painted. Likewise, they seldom mask around door openings or trim such as window casings, chair rail or baseboards. Therefore, without a reason to mask those items, do not allow such masking in estimates.

Estimating Trusses
A truss is made up of several parts:
- **Top chord** Serves as a roof rafter.
- **Bottom chord** Serves as a ceiling joist. **Note:** The length of the bottom chord is the “span.”
- **Webbing** Bracing that ties top and bottom chords together.
- **Gussets** Wood or metal plates that hold the pieces together at the joints.

To determine the linear feet of trusses on a building, you need the following information:
- **Span** of a truss. The span of a truss is the length of its bottom chord. This is usually the width of the building the trusses are resting on.
- **O.C.** of the trusses. The on-center (o.c.) of the trusses is the distance from the centerline of one truss to the centerline of an adjacent truss. Common truss spacing is 24” o.c. (also called 2’ o.c.).
- **Length** of the building. This does not include the roof overhang. It is the distance from end wall to end wall.

Formula: \[
\text{# of trusses} = \frac{\text{Length of building (in inches)}}{\text{o.c. (in inches)}} + 1
\]
\[
\text{# of trusses} \times \text{span of one truss} = \text{total LF of trusses}
\]

The slope of the truss is also important. The truss prices change for different slopes.
- **Slope** of the truss. Slope is the inches of vertical rise in the top chord of the truss in 12 inches of horizontal run.
As the slope increases, the pitch of the roof increases. It takes more lumber to build a truss with a greater slope because the top chords are longer and the trusses extend up higher. Therefore, as the truss slope increases, the truss cost increases.

The following diagram shows the parts of a common "W" truss and “Gable-end” truss.

**Parts of a Roof**

These are the most common parts of a roof:
Roof Sheathing

Applied to the top chord of trusses or roof rafters, to support roofing material, is sheathing. Sheathing forms the deck for roofing material application.

Solid sheathing, such as plywood, oriented strand board, wafer board or dimensional lumber, support a variety of types of roofing materials. Solid sheathing is used with composition shingle application because it provides a smooth base for application.

Spaced sheathing is normally found beneath wood shingles or shakes. Spaced sheathing is usually 1” x 4” or 1” x 6” softwood boards. These boards are spaced to coincide with the exposure of the shingles or shakes. Typically, wood shingles are installed with a 5½” exposure and its spaced sheathing at the same 5½” on-center. Shakes are normally installed with a 7½” exposure and its spaced sheathing at 7½” on-center. Spaced sheathing provides openings between boards to allow wood roofs to ventilate and evenly dry following rain. Spacing also allows shingles to be nailed to the center of the spaced sheathing board.

Solid sheathing is acceptable beneath wood shingles or shakes and may be required in some parts of the country. Solid sheathing is recommended under shakes in areas where wind-driven snow is common.

Roofing Materials

The most common roofing material is composition shingles. These styles are most popular:

- T-Lock Composition shingles
- 3-Tab Composition shingles
- Laminated Composition shingles

Composition shingles are made of fiberglass or asphalt-saturated roofing material embedded with mineral granules. For any design, different weights are available. The weight is per square (100 SF) of shingles.

The most common shingle is a *three-tab square butt shingle*. These range from 200 lb. to 240 lb. and are packaged three bundles per square. These are referred to as light to medium weight shingles.

Next to three-tabs, laminated (*also called architectural*) shingles are most common. Laminated shingles give a "layered" look of a wood roof. Laminated shingles range from 240 lb to 500 lb., come three or four or more bundles per square, and are medium to heavy weight shingles.

In addition to rating shingles by the weight per square, shingles are also rated by the length of the warranty on them. The warranty normally lengthens as weight increases.

Wood roofing can be divided into two categories, shingles and shakes. Wood *shingles* are manufactured in random widths and are normally 16", 18", or 24" in length. The butt ends vary in thickness from 1/2" to 3/4", but are uniform for each length of shingle. Both surfaces are taper
sawn so the shingles lay flat. Wood *shakes* come hand-split (or hand-split and re-sawn), taper split, or straight split. All “split” surfaces are rough. The hand-split and re-sawn shakes have a sawn or smooth back and a rough face. With a smooth back, they lay flatter than the other styles of shakes. Shakes come in random widths. Standard lengths are 18" and 24" inches. Shingles and shakes come four bundles to a square and are purchased by the bundle or square.

Rigid roofing materials include, but are not limited to, shingles or tiles made of clay, aluminum, steel, copper, fiberglass, concrete, slate or plastic. Rigid roofing is sold by the piece, in bundles, and in squares. These products do not deteriorate easily and are more durable than the other roofing materials. Rigid products are also heavier and require more labor to install than wood or composition roofing.

**Roofing Vents**

One important part of all roofs not shown in the figure above is *roof vents*. There are several types, but all serve the same function. Roof vents allow heat and moisture to escape the attic. This increases the life of the roof by slowing deterioration from excessive heat and moisture in the attic. Three basic types of vents found on the roof are:

**Ridge Vent**: Normally runs most of the length of the ridge.

![Ridge Vent](image)

**Roof Vent**: Sometimes called a turtle vent, normally box-shaped and made of aluminum or vinyl. Several are usually installed on a back slope.

![Roof Vent](image)

**Turbine Vent**: These vents usually extend above the roof surface and include a turbine shaped set of louvers that spin when the wind blows.

![Turbine Vent](image)
A Cupola is a special type of vent seen most often in barns but occasionally on homes.

Other types of roof vents include Power Ventilators which force air movement through an attic. Power vents are normally larger than roof vents and usually have a bubble-shaped cover. They have an electric motor and fan controlled by a thermostat in the attic. At a preset temperature, the thermostat turns the motor on and draws hot air out of the attic.

**Exterior Finishes**

Exterior finish products generally include exterior wall coverings, trim around doors and windows, soffit and fascia. Exterior finish products do not directly contribute to the structural integrity of the building. They provide a covering that protects the framing, insulation, and interior from weather. Exterior wall products also contribute to the appearance of the building.

There are two categories of exterior finishes: masonry and non-masonry.

Masonry products include brick veneer, stucco (true and synthetic), concrete block and stone (true and synthetic). Glass blocks also form an exterior finish for some window installations, and are installed by a brick mason. Common stone products include granite, sandstone, marble, slate and limestone. In some earlier construction, brick was not a veneer, but a structural part of walls and exterior finishes.

Non-masonry products include wood, aluminum, vinyl, steel, vinyl clad and hardboard siding. Siding products are usually measured by the square foot and sold by the square (100 SF) or piece. Wood siding includes cedar shingles, plywood sheets, beveled or lap, drop, board and batten, reverse board and batten and a style of sheet called T1-11. Wood siding is very common, but is more vulnerable to deterioration than the other siding products. Wood siding requires periodic painting or staining to protect it cosmetically and structurally.

Aluminum sheets or panels can be pressed or molded to provide almost any desired shape or look. Aluminum has a baked-on enamel factory finish and can provide an appearance that closely resembles painted wood siding. Aluminum siding requires little maintenance.

Vinyl siding is made of a rigid polyvinyl-chloride (PVC) compound that is tough, durable, and economical. Vinyl siding is manufactured in various thicknesses with color added to the siding during the manufacturing process. Vinyl siding may be installed with a backer board. The backer board is an insulation board that may be attached directly to each sheet of vinyl. The backer enhances the rigidity and strength of the siding, and increases the R-value.

Steel siding is more durable than vinyl, aluminum or vinyl-clad siding. Like aluminum siding, steel siding has a baked-on enamel factory finish. You can distinguish between steel and
aluminum by trying to stick a magnet to it. The magnet will stick to steel but not aluminum. Vinyl-clad siding is aluminum siding with a vinyl coating over it. It is more dent-resistant than aluminum and has fewer tendencies to crack than vinyl.

Hardboard siding (often called "masonite siding") is available in sheets, 4' wide and 8', 9', or 10' long. It is also available as horizontal lap siding. The most common thickness is 7/16”.

Hardboard siding is normally primed at the factory and painted on the job.

A relative new-comer to siding is fiber cement. Available in shingles, boards or sheets, it is installed in the same manner as wood siding, but is more resistant to weather and insects than wood or hardboard siding. Fiber cement is usually pre-primed at the factory and finish painted on the jobsite. A common name for fiber cement siding is “Hardie” plank or board, because a major manufacturer is the James Hardie Company.

**Soffit and Fascia**

The soffit is the underneath side of the roof overhang or eave in a closed cornice. It can be made of wood (usually plywood), aluminum, or vinyl. Wood soffits will often have vents cut into them. Vinyl and aluminum soffits are available in solid or perforated (for vents) sections. The carpenter normally installs the wood soffits and may install the aluminum and vinyl soffits. Aluminum and vinyl soffits are often installed by the siding contractor. All soffit material is estimated by the SF.

Fascia is the wood finish board, or aluminum or vinyl trim piece that covers the sub-fascia and/or the end of the rafter or truss tails. Redwood, cedar, and pine are used for wood fascia. Wood fascia requires periodic maintenance such as painting or staining. Aluminum and vinyl are considered maintenance-free materials and are often installed over the top of the wood fascia so the fascia no longer has to be painted or stained. Wood fascia is normally purchased by the linear foot of board. Aluminum and vinyl fascia trim is normally purchased by the piece (10' - 12’ long) and estimated by the LF.
Gutters

Gutters are the troughs attached to eaves to catch and divert water running off a roof. Guttering includes downspouts. Gutters can be made of aluminum, galvanized steel, vinyl, copper or wood. They are measured by the LF.

Insulation

Insulation is any material that resists the passage of heat into or out of a building. It surrounds living or work areas and foundations. It is installed in floors, walls, ceilings or attics. As a general rule, for any type of insulation, the thicker the insulation, the more it resists heat transfer. This resistance to heat transfer is called R-Value. There are many types of insulation.

Rigid polystyrene is usually a white or blue board that varies in thickness and size. It is usually nailed or glued in place and used to insulate concrete footings and slabs, and concrete or concrete-block foundations or basement walls.

Batt insulation is a roll of pre-cut pieces made to fit standard wall cavities. There are several types of batt insulation. Paper-(kraft) backed insulation has paper attached to the insulation on one side. The paper serves as a vapor barrier to keep moisture from traveling through the walls into the insulation. It also reduces air infiltration through the wall. If applied properly, this also keeps moisture from getting trapped in the insulation. Moisture trapped in the insulation reduces its R-Value. Foil-backed insulation has a metal foil attached to the insulation on one side. It functions as a moisture barrier in the same way as paper-backed. Additionally, the foil also tends to help reflect heat back into the room, reducing heat loss. Unfaced insulation (also called friction fit) has no backing. It is used in walls. Because it has no backing, the inside wall surface is often covered with plastic to provide the vapor barrier.

Blanket insulation is an uncut roll of insulation cut to length at the job site. It is used in walls and attics, and may or may not have a backing on it.

Cellulose insulation is treated, ground-up newspaper that is blown into wall cavities and attics. It is normally gray in color.

Shredded-styrene insulation is a white, Styrofoam-type material used primarily to fill cavities in masonry-block walls.

Vermiculite insulation is a tan, Styrofoam-type material used primarily to fill cavities in masonry-block walls.

Shredded-fiberglass insulation is blown into wall cavities and attics. It is normally white in color.

Following are 9 exercises to complete as part of this guide.

An answer key and Inch to Foot Conversion Chart follow the exercises.
Exercise 1 - Two questions
Remove and replace 1/2" drywall on a ceiling. The ceiling has blown-acoustic (popcorn) texture.
1. What is (are) the category and selector code(s) for the drywall and acoustic texture?

2. What is (are) the unit price(s) for this repair?

Exercise 2 - Two questions
Remove and replace 1/2" drywall on a ceiling. The ceiling has orange-peel texture.
1. What is (are) the category and selector code(s) for the drywall and orange-peel texture?

2. What is (are) the unit price(s) for this repair?

Exercise 3 - Two questions
There is new drywall (1/2" hung, taped, floated, ready for paint) on the walls and ceiling.
1. What is (are) the category and selector code(s) for painting the walls?

2. What is (are) the unit price(s) for this repair?
**Exercise 4 - Six questions**

- Building is 40’ x 30’. Roof is 42’ gable end to gable end and 34’ eave to eave.
- Standard load, untreated trusses on 4/12 slope.
- 24” on center.

Answer the following questions relative to the above diagram and information:

1. What is the span of a required truss?

2. How many trusses would be required to replace the roof structure on this building?

3. What is the total LF of trusses required for this building?

4. What is the category and selector code for the required trusses?

5. What is the LF unit price to replace the trusses if the building has burned to the ground?

6. What is the total cost to replace all the trusses on this building?
Exercise 5 - Five questions

Answer the following questions regarding the above roof:

1. How many squares of 220 # composition shingles would you remove from the entire roof?

2. What is the unit cost for removing a square of 220 # composition shingles?

3. How many squares of 220 # composition shingles would be required to replace the entire roof? Assume three bundles of shingles per square.

4. What is(are) the category code(s), selector code(s), and unit price(s) for replacing the roof?

5. What is the area of slope “A?”
**Exercise 6 - Six questions**

Answer the following questions regarding the above roof:

1. How many squares of wood shingles would you remove from the entire roof?

2. What is the unit cost for removing a square of wood shingles?

3. How many squares of wood shingles would be required to replace the entire roof? Assume four bundles of shingles per square.

4. What is the category code, selector code, and unit price for replacing the wood shingles?
   A. Category code?
   B. Selector code?
   C. Unit price per square?

5. What is the area of slope “A?”

6. What is the area of slope “B?”
Exercise 7 - Four questions

Answer the following questions regarding the above roof:

1. How many squares of wood shakes would you remove from the entire roof?

2. What is the unit cost for removing a square of wood shakes?

3. How many squares of medium wood shakes would be required to replace the entire roof? Assume four bundles of shakes per square.

4. To replace medium wood shakes, what is the:
   A. Category code?
   B. Selector code?
   C. Unit price per square?
Exercise 8 - Ten questions

- Wall Height: 8’ 0”
- Wall thickness 4”
- Exterior/perimeter doors: 3’0” x 6’8”
- Pantry and closet doors: 3’0” x 6’8”
- Patio door (family room, west end): 6’0” x 6’8”
- Kitchen to family room opening: 3’0” x 6’8”
- Kitchen window: 3’0” x 2’0”
- Family room windows: 3’0” x 4’0” @ 2
  6’0” x 5’0” @ 1
- Base trim does not surround the cabinets.
- No hardwood floor under the cabinets.
- Dashed lines in kitchen represent upper cabinets. The upper cabinets butt against the casing on the kitchen window. Upper cabinets are standard 1’ depth.
- Base cabinets are standard 2’ deep.
- The north wall of the kitchen is an interior wall. All other perimeter walls are exterior walls.
- Exterior siding height is 9 ft.
1. How many SF of exterior wall studs?

2. How many SF of interior wall studs?

3. How many SF of exterior siding?

4. How many LF of baseboard in the kitchen and the pantry?

5. How many LF of upper cabinets in the kitchen?
6. How many LF of base cabinets in the kitchen?

7. How many SF of drywall on the walls and ceilings of the family room and the closet?

8. How many LF of baseboard in the family room and closet?

9. How many SF of carpet would you remove from the family room and closet?
   Assume the carpet is sold in a 12’ width.

10. How many SF of carpet would be required to replace the carpet in the family room and closet, when there is only one seam, running north/south? Assume replacement carpet is 12’ wide.
Exercise 9 - Ten questions

The above diagrams represent a house that burned to the ground. The slab is structurally undamaged. The debris from the wood structure has been cleared and hauled away.
For each of the following questions:

- Calculate the quantity needed.
- Show the desired category code and selector code.
- Show the unit price.

1. 220 lb. 3-tab composition shingles to replace the roof?
   
   Quantity:

   Category code and selector code:
   
   Unit price:

2. Square feet of exterior 2" x 4" - 16" o.c. stud walls? (assume a truss-built roof)
   
   Quantity:

   Category code and selector code:
   
   Unit price:

3. Linear feet of interior 2" x 4" - 16" o.c. stud walls?
   
   Quantity:

   Category code and selector code:
   
   Unit price:

4. Vinyl siding on the east end?
   
   Quantity:

   Category code and selector code:
   
   Unit price:

5. 6-inch wood fascia on all four sides?
   
   Quantity:

   Category code and selector code:
   
   Unit price:
6. Wood soffit on all four sides? (1' overhang on eaves; 1'4” on gable ends)
   Quantity:

   Category code and selector code:
   Unit price:

7. 6-inch batt insulation in the attic?
   Quantity:

   Category code and selector code:
   Unit price:

8. 4-inch batt insulation (R-11) in the walls?
   Quantity:

   Category code and selector code:
   Unit price:

9. 3 ¼” paint-grade baseboard in Bedrooms 1 and 2 and Closets 1 and 2?
   Quantity:

   Category code and selector code:
   Unit price:

10. ½” drywall in Bedroom 1 and Closet 1?
    (Walls are floated, ready for paint. Ceilings are ready for texture.)
    Quantity:

    Category code and selector code:
    Unit price:
Exercise 1

*Answer Key*

1. **DRY 1/2-** (1/2" drywall - hung, taped, ready for texture)

   **DRY AC** (Acoustic ceiling "popcorn" texture)

   Both of these items are done by the drywall tradesperson and found in the drywall category.

   **Note:** The DRY TEX- quality statement says "Includes orange peel or similar machine applied texture." Some areas might consider blown acoustic to be a "similar machine applied texture". However, DRY AC is a code specifically designed and priced for blown acoustic, and is the one that should be used. DRY TEX- is more generic and not a good choice for acoustic ceiling.

2. **DRY 1/2-** @ $1.43/SF. This is the "remove and replace" price for the drywall.

   **DRY AC** @ $0.56/SF. This is the "replace" price. Since the acoustic comes off with the drywall removal, do not use the "remove and replace" price for the acoustic.

Exercise 2

*Answer Key*

1. **DRY 1/2** (1/2" drywall - hung, taped, floated, ready for paint)

   In this case, one code will take care of both the drywall and the texture. The "Item Information" for DRY 1/2 says "Light orange peel texture, or smooth finish, ready for painting." That means it can be either one of those finishes. As a last step, the drywall tradesperson either adds the last coat of mud and sands it, or (instead of the last coat of mud) he blows on the orange-peel texture.

   If you use DRY 1/2 and DRY TEX-, you pay for the orange-peel texture twice. It is included in DRY 1/2 and DRY TEX-.

   Use **DRY 1/2- and DRY TEX-** in a spot repair situation. DRY 1/2- is ready for texture (not ready for paint) and DRY TEX- adds the orange-peel texture.

   The edges of the drywall patch (repaired area) require a smooth surface to tape and float. Additional texture is removed around the patch to get the required smooth surface. Therefore, in a spot repair, it is common for the SF of texture to be greater than the SF of drywall, so you use separate code for drywall and texture.

   In new installation (example: replacing all the ceiling drywall and orange peel texture), it is more efficient to use one code (DRY 1/2) to do it all. Using DRY 1/2- and DRY TEX- takes two lines rather than one on your estimate.
2. If a total replacement of drywall and orange-peel:

   **DRY 1/2 @ $1.60/SF**

   If a repair situation with unequal amounts of drywall and texture:

   **DRY 1/2- @ $1.43/SF and DRY TEX- @ $0.23/SF**

**Exercise 3**

*Answer Key*

1. **PNT SP**

   Seal (1 coat) and paint (1 coat)

   PNT SP is one coat of sealer (primer) and one coat of paint for a total of two coats. A prime/seal coat and one coat of finish paint is common practice for new drywall.

   **Note:** PNT P2 would be acceptable since it is a total of two coats of paint just like SP. In many areas, painters use two coats of finish paint rather than a coat of sealer and a coat of finish paint.

   PNT SP2 would be incorrect. This code is one coat of sealer and two coats of finish paint for a total of three coats.

2. **PNT SP @ $0.50/SF or PNT P2 @ $.51/SF**

**Exercise 4**

*Answer Key*

1. The **width** of the building is 30' from outside wall to outside wall. This is also known as the **span** or **bottom chord length** of the truss. The bottom chord length (span) is the length of the truss for our pricing purposes.

   **30 LF**

2. The formula for calculating the # of trusses for a building is:

   \[
   \text{[Length of building (inches) ÷ on-center of trusses (inches)] + 1 = # of trusses} \\
   \text{[(40' × 12) ÷ 24] + 1 =} \\
   \text{[480 ÷ 24] + 1 =} \\
   \text{20 + 1 = 21 trusses}
   \]

3. To find the # of LF of trusses needed for this home, take the # of trusses from answer 2 above times the span of one truss (in this case, the width of the house).

   **21 trusses × 30' = 630 LF of trusses**

4. **FRM TR4** is the category code and selector code for a 4/12 slope truss.

5. **$4.41/LF** is the REPLACE price for either a "W" truss or a gable-end truss.

6. Multiply the LF of trusses by the unit cost per LF.

   **630 LF × $4.41 ÷ LF = $2778.30**
Exercise 5

*Answer Key*

1. \(55 \times 15 \times 2 = 1,650 \text{ SF}\)
   \[1,650 \div 100 = 16.5 \text{ SQ}\]

2. RFG ARMV @ $33.18/SQ

3. \(55 \times 15 \times 2 = 1,650 \text{ SF}\)
   \[1,650 \times 1.1 = 1,815 \text{ SF}\]
   \[1,815 \div 100 = 18.15 \text{ SQ} \text{ rounded up to 18.33 SQ}\]

4. RFG 220 @ $95.22/SQ
   
   *Note:* Composition shingles are purchased in bundles. There are usually three bundles in a square. Consequently, on replacement calculations, we round to the nearest \(\frac{1}{3}\) square (.33, .67, or the next whole #).

5. \(55 \times 15 = 825 \text{ SF}\)

Exercise 6

*Answer Key*

1. \(50 \times 19.5 \times 2 = 1,950 \text{ SF}\)
   \[1,950 \div 100 = 19.5 \text{ SQ}\]

2. RFG WSRMV @ $38.19/SQ

3. \(50 \times 19.5 \times 2 = 1,950 \text{ SF}\)
   \[1,950 \div 100 \text{ SF} = 19.5 \text{ SQ}\]
   \[19.5 \text{ SQ} \times 1.15 = 22.425 \text{ SQ}\]
   \[22.425 \text{ SQ} \text{ rounded up to 22.5 SQ}\]
   *Note:* Wood shingles and shakes are purchased in bundles. There are normally four bundles in a square. Consequently, on replacement calculations, we round to the nearest \(\frac{1}{4}\) square (.25, .5, .75, or the next whole #).

4. RFG WSTP @ $478.07/SQ

5. \([(50 + 18) \div 2] \times 19.5 = 663 \text{ SF}\)

6. \((32 \times 19.5) \div 2 = 312 \text{ SF}\)
Exercise 7  

*Answer Key*

1. \(60 \times 15 \times 2 = 1,800 \text{ SF}\)
   \(10 \times 12.5 \times 2 = 250 \text{ SF}\)
   \(5 \times 12.5 \times 2 = 125 \text{ SF}\)
   
   \[1,800 + 250 + 125 = 2,175 \text{ SF}\]
   \[2,175 \div 100 = 21.75 \text{ SQ}\]

2. RFG WSRMV @ $38.19/SQ

3. \(60 \times 15 \times 2 = 1,800 \text{ SF}\)
   \(10 \times 12.5 \times 2 = 250 \text{ SF}\)
   \(5 \times 12.5 \times 2 = 125 \text{ SF}\)
   
   \[1,800 + 250 + 125 = 2,175 \text{ SF}\]
   \[2,175 \div 100 = 21.75 \text{ SQ}\]
   \[21.75 \text{ SQ} \times 1.10 = 23.925 \text{ SQ}\]
   \[23.925 \text{ SQ} \text{ rounded up to} 24 \text{ SQ}\]

4. A.: RFG
   B.: WSHK
   C.: $306.29/SQ

Exercise 8  

*Answer Key*

1. Starting from the northeast corner of the building and working in a clockwise direction:  
   (remember to allow for the 4” thickness of the walls)
   \[3’4” + 9’4” + 1’ + 2’ + 10’ + 18’8” + 12’4” + 1’ + 12’4” = 70’0” \text{ of exterior walls.}\]
   \[70.00 \text{ LF} \times 8’ = 560.00 \text{ SF of exterior wall studs}\]

   Note: Openings are not considered for deduction from framing.

2. Starting with the north wall of the kitchen and working in a clockwise direction in the kitchen, then in the family room:
   \[20’ + 3’ + 2’8” + 18’ + 4’ + 1’8” = 49’4” \text{ of interior walls}\]
   \[49.33 \text{ LF} \times 8’ = 394.64 \text{ SF of interior wall studs}\]

   Note: Openings are not considered for deduction from framing.
3. Starting from the northeast corner of the building and working in a clockwise direction (remember to use exterior dimensions and allow for the 4” thickness of the walls): 
12’8” + 1’0” + 12’4” + 18’8” + 12’4” + 1’0” + 12’8” = 70.67 LF of exterior wall.
Multiply 70.67 LF of exterior wall by the exterior wall height of 9’ to arrive at the gross area of siding. 70.67 × 9 = 636.06 SF
From that, deduct for openings:
636.06 SF - (6’ × 6’8” for the patio door) - (6’ × 5’ for the east family room window) = 636.06 - (6 × 6.67) – (6 × 5) =
636.06 - 40.02 - 30 = 566.01 SF

4. First, calculate the gross LF of baseboard in the kitchen and pantry.
17’ + 3’ + 3’ + 9’ + 20’ + 12’ = 64 LF for the kitchen perimeter
2’8” + 2’8” + 2’8” + 2’8” = 10’8” sums the baseboard inside the pantry.
Total gross LF of baseboard before deducting openings = 64’ + 10’8” = 74’8”
Now, sum all openings (i.e. LF of wall where there is no baseboard).
Starting on the north wall of the kitchen:
8’ (cabinets/north wall – ignore the 2’ cabinet as it is less than 3 LF wide)
12’ (cabinets/west wall)
8’ (cabinets/south wall)
28 LF
Finally, subtract the sum of the openings from the gross LF of baseboard before openings: 74’8” gross LF – 28 LF of openings = 46’8” net LF of baseboard

Note: Please refer to page 6 where we discussed deducting openings in trim.
In that section we stated:
“A common example is deducting for a doorway opening when estimating baseboard. Assuming the doorway is greater than (emphasis added) 3’0” x 6’8”, add up the total Linear Feet (LF) of walls in the room, including the doorway. To get the adjusted amount, subtract the width of the doorway from the total.”
In this example, the only places without baseboard greater than 3’0” wide were the continuous lower cabinets. Therefore the only openings we would deduct are the lower continuous cabinets, which sum 28 LF.

5. There is more than one way this result can be calculated.
We will take the total LF along the walls where upper cabinets are located, then subtract openings and overlap at inside corners (where one cabinet would butt against another one).
Starting at the northeast end of the upper cabinets:
2’ + 3’ + 8’ + 12’ + 8’ = 33 LF (before openings and overlap)
Now, sum the openings and overlap: 1’ (overlap at northwest inside corner) + 3’ (kitchen window opening) + 1’ (overlap at southwest inside corner) = 5 LF of openings and overlap.
Finally, subtract the sum of the openings and overlap from the gross LF of upper cabinets before openings and overlap: 33 LF – 5 LF = **28 LF of upper cabinets**

**Note:** The standard depth of an upper cabinet is 12” or 1’. Only one cabinet can extend into the corner. The other cabinet will start at the face of the one in the corner. In the calculation above, we measured from the corner in both directions which means we extended both cabinets into the corner. To correct for that methodology, we subtract 1’ (the depth of an upper cabinet) at each corner.

We also measured across the window in our gross LF calculations, so we had to deduct 3’ for the window.

6. We will calculate the lower cabinets the same way we calculated the upper cabinets in 5 above, but the overlap at the corners is 2’ (the depth of the lower cabinets) rather than 1’.

Starting at the northeast end of the lower cabinets:
2’ + 8’ + 12’ + 8’ = 30 LF (before openings and overlap)

Now, sum the openings and overlap: 2’ (overlap at northwest inside corner) + 2’ (overlap at southwest inside corner) = 4 LF of openings and overlap.

Finally, subtract the sum of the openings and overlap from the gross LF of base cabinets before openings and overlap: 30 LF – 4 LF = **26 LF of lower cabinets**

7. First, calculate the gross area of walls and ceilings of the family room and closet. Then subtract for openings.

Starting with the north wall of the family room (moving counter-clockwise):
14’ + 12’ + 18’ + 10’ + 4’ + 2’ = 60 LF of perimeter walls in family room

Now calculate the LF of walls in the closet:
3’8” + 1’8” + 3’8” + 1’8” = 10’8” of walls in the closet.

Sum the wall lengths of the family room and the closet, then multiply by their height:
(60’ + 10’8”) x 8” (wall height) =
70.67 x 8 = 565.36 SF of walls before openings

Next, calculate the area of the entire ceiling:
(14’ x 12’) + (4’ x 10’) + (3’8” x 1’8”) = 168 + 40 + 6.13 = 214.13 SF of ceiling

Now, sum the areas of the walls and ceiling:
565.36 + 214.13 = 779.49 SF of walls and ceilings (Remember this is the gross area before openings)

We must now calculate the area of the openings we must deduct:
6’ x 6’8” for the patio door and 6’ x 5’ for the east family room window
(6 x 6.67) + (6 x 5) =
40.02 + 30 = 70.02 SF of openings
Finally, subtract the sum of the openings from the gross area of the walls and ceiling:
779.49 SF (gross) - 70.02 SF (openings) = **709.47 SF of drywall on the walls and ceiling.**

**Note:** Please refer to page 5 where we discussed deducting openings in walls and ceilings.

In that section we stated:

“When estimating repairs to walls and ceilings, we must consider other materials or items that share the same space or area. For example, if you are estimating to paint a wall that has a window, you must consider the surface area of the window as an interruption of the wall surface area being painted. We refer to this single and continuous interruption as an "opening" in the material being estimated.

When deducting openings, use common sense and good judgment. Consider deducting openings larger than a standard 3’0” x 6’8” exterior door.”

In this example, there are one doorway and one window greater than 3’0” × 6’8”. Therefore the only openings we would deduct are these two, which sum 70.02 SF.

8. Calculate the gross LF of baseboard in the family room and closet, then subtract openings.

Starting with the north wall of the family room, calculate the LF of walls in the family room and closet in the same manner as in question 7 above. The gross is 70’8” of walls.

Therefore, the total LF of baseboard before openings equals 70.67 LF

Sum the appropriate openings to deduct (LF of wall where there is no baseboard).
6’ (patio door) = 6 LF of openings to deduct  See Note below!

Finally, subtract the openings to deduct from the gross LF of baseboard:
70.67 LF – 6 LF = **64.67 LF of baseboard**

**Note:** We intentionally used the term “appropriate” openings above.

Please again refer to page 6 where we discussed deducting openings in trim.

In that section we stated:

“A common example is deducting for a doorway opening when estimating baseboard. Assuming the doorway is greater than (emphasis added) 3’0” x 6’8”, add up the total Linear Feet (LF) of walls in the room, including the doorway. To get the adjusted amount, subtract the width of the doorway from the total.”

In this example, there is only one doorway greater than 3’0” × 6’8”. Therefore the only opening we would deduct is the patio door, which is 6 feet wide.

9. Family room, including closet: 14’ × 12’ = 168.00 SF

4’ × 10’ = 40.00 SF
3’8” × 1’8” = 6.13 SF
214.13 SF of carpet to remove.

10. Carpet required to replace the family room and closet, with one north/south seam:

   **Note:** When manually calculating required replacement carpet, enough material must be included to allow 3” for each dimension of the room and along each seam. This additional amount is required to allow for room irregularities. In addition, enough material must be included to reach the seam in the doorway (the location of any transition strip or seam placement) and then add 3”.

   **NOTE:** When graphically estimating using Xactimate® - The software recognizes these requirements and automatically includes the required allowance. Therefore, when graphically estimating, the 3” allowance should NOT BE included in any dimensions.

In this case, the combined width of two pieces of 12’ carpet (24’) allows sufficient material for the east/west dimension of 18’.

For the north/south dimensions, we must measure the first piece to the seam/transition strip in the opening to the kitchen and add 3” (12’ room + 2” to the transition strip + 3”). The second piece only extends to the wall, so we only need the room dimension plus 3” (12’ + 3”).

   Piece 1 – 12’5” × 12’ = 149.04 SF
   Piece 2 – 12’3” × 12’ = 147.00 SF

   Replacement Carpet Amount = 296.04 SF

**Exercise 9**

*Answer Key*

1. Quantity:      52 × (15.5 + 15.5) = 1612 SF
   1612 SF ÷ 100 = 16.12 SQ
   16.12 SQ × 1.1 = 17.73 SQ including 10% waste
   17.73 SQ rounded up to 18 SQ

   Category code and selector code: RFG 220

   Unit price:      @ $95.22/SQ

2. Quantity: Determine the length of each wall, sum the wall lengths, then multiply by the wall height. The north and south walls are 49’4” each. The east and west walls are 25’4” each (deduct the 4” overlap in each corner).

   49.33 + 49.33 + 25.33 + 25.33 = 149.32 LF

   149.32 LF × 8’ wall height = 1194.56 SF of stud walls.

   **Note:** We did not add in SF of walls for the triangular gable ends. The framing for the triangular ends is paid for as part of the roof trusses. There is a gable-end truss on each...
end of the house. The gable-end truss includes studs on the same centers as the walls. Since the trusses include framing for the triangular ends, we do not need to include the triangular gable ends as part of the wall framing.

Had this been a stick-built roof (ceiling joists, rafters, etc.), framing for the triangular gable ends would have been calculated as part of the wall framing.

Category code and selector code: \text{FRM 4SF}  
Unit price: \$1.36/SF (the REPLACE price since this house burned and the debris has been cleared)

3. Quantity:
   BR 2:  
   13’ (east wall) + 14’4” (south wall) + 5’4” (south closet wall) + 13 (east closet wall) = 45’8”
   BR 1:  
   12’ (east wall) + 12’ (east closet wall) = 24’0”
   Bathroom:  
   3’ (west shower wall) + 8’4” (east bathroom wall) + 13’ (south bathroom wall) = 24’4”

   The Kitchen and Living Room have no interior walls not already included.

   Therefore, sum the subtotals above: $45.67 + 24 + 24.33 = 94 \text{ LF of interior stud walls}$

   Category code and selector code: \text{FRM 4LF}  
   Unit price: \$10.71/SF

4. Quantity: Calculate the gross area then subtract openings:
   \[ (26’ \times 9’) = 234.00 \text{ SF} \text{ (Wall area)} \]
   \[ (26’ \times 7’) \div 2 = 91.00 \text{ SF} \text{ (Gable area)} \]
   \[ 325.00 \text{ SF gross area} \]
   Opening is 6’ × 5’ window: 6 × 5 = 30.00 SF
   (Kitchen window is less than area of a standard size door so we will not deduct that opening)
   \[ 325.00 \text{ SF} – 30.00 \text{ SF} = 295.00 \text{ SF of siding} \]

   Again, refer to page 5 where we discussed deducting openings in walls and ceilings.

   Category code and selector code: \text{SDG VINYL}  
   Unit price: \$2.29/SF
5. Quantity: Calculate the perimeter of the roof starting with the north side:

\[52 + 15.5 + 15.5 + 52 + 15.5 + 15.5 = 166 \text{ LF of 6-inch wood fascia}\]

Category code and selector code: SFG FACW6

Unit price: @ $3.91/LF

6. Quantity: Soffit is calculated by the SF.

Eaves: \[(49'4'' + 49'4'') \times 1' (\text{overhang}) = 98'8'' \times 1' = 98.67 \text{ SF}\]

Gable ends: \[(15'6'' + 15'6'' + 15'6'' + 15'6'') \times 1'4'' (\text{overhang}) = 62' \times 1'4'' = 82.46 \text{ SF}\]

*Note:* We have not included any overlap at the eave on the gable ends.

\[98.67 \text{ SF} + 82.46 \text{ SF} = 181.13 \text{ SF of wood soffit}\]

Category code and selector code: SFG SFTW

Unit price: @ $3.23/SF

7. Quantity: Calculate the SF of attic space in the house

\[49.33 \times 26 = 1282.58 \text{ SF of attic insulation}\]

Category code and selector code: INS BT6

Unit price: @ $0.70/SF

8. Quantity: Calculate the SF of exterior walls then subtract for openings.

Starting with the northeast corner, moving clockwise:

\[(25'4'' + 49'4'' + 25'4'' + 49'4'') \times 8' = 149'4'' \times 8' = 1194.64 \text{ SF before openings}\]

Openings are the 6’ × 5’ east end window and the 6’ × 6’8” living room door.

\[6 \times 5 + (6 \times 6.67) = 30 + 40.02 = 70.02 \text{ SF of openings}\]

\[1194.64 \text{ SF gross} - 70.02 \text{ SF openings} = 1124.62 \text{ SF of 4” insulation}\]

Category code and selector code: INS BT4

Unit price: @ $0.49/SF

9. Quantity: Calculate the perimeter of both BR’s and closets, then subtract openings:

<table>
<thead>
<tr>
<th>BR 2</th>
<th>14’ + 13’ + 14’ + 13’ = 54 LF</th>
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<tbody>
<tr>
<td>CL 2</td>
<td>5’ + 13’ + 5’ + 13’ = 36 LF</td>
</tr>
<tr>
<td>BR 1</td>
<td>14’ + 12’ + 14’ + 12’ = 52 LF</td>
</tr>
<tr>
<td>CL 1</td>
<td>5’ + 12’ + 5’ + 12’ = 34 LF</td>
</tr>
</tbody>
</table>

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54 + 36 + 52 + 34 = **176 LF** of baseboard

Referring to page 6 where we discussed deducting openings in trim, there are no openings greater than 3’ wide. Therefore, in this instance, we do not subtract any openings.

Category code and selector code: **FNC B3**

Unit price: @ **$2.27/LF**

10. Quantity: Since the finish on the walls and ceilings are different, the areas must be determined individually.

BR 1 walls: 14’ + 12’ + 14’ + 12’ = 52 LF of walls
CL 1 walls: 5’ + 12’ + 5’ + 12’ = 34 LF of walls

Wall Quantity: 52 LF + 34 LF = 86 LF of walls × 8’ high = **688 SF** of walls

Wall Category code and selector code: **DRY ½** (Floating, ready for paint)

Wall unit price: @ **$1.35/SF**

BR 1 ceiling: (14’ × 12’) = 168 SF
CL 1 ceiling: (5’ × 12’) = 60 SF

Ceiling Quantity: 168 SF + 60 SF = **228 SF** of ceilings

Ceiling Category code and selector code: **DRY 1/2-** (Ready for texture)

Unit price: @ **$1.18/SF**
## Inch to Foot Conversion Chart

<table>
<thead>
<tr>
<th>Inches</th>
<th>Decimal Feet</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 inch</td>
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<tr>
<td>2 inches</td>
<td>0.17 feet</td>
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<tr>
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