

**Adaptation: Developing Open Problems from Closed Curricula**

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Discuss!

What mathematical experiences have influenced you as an educator?

How do you structure your planning time?

What are design parameters of high quality tasks?

Quick hits:

Attributes of a quality problem:

- Multiple entry points/solution paths
- Immediately engaging and interesting
- Low barrier of entry, high ceiling
- The math is unavoidable!

Additional Adaptation Modes:

- Let students ask & develop the question based on the information
- Include an interesting diagram / photo / animation
- Ask students to estimate or give a range of outcomes before beginning

Places to find problems that need no adaptation:

- Dan Meyer's Three Act Tasks
- Robert Kaplinsky's Lessons
- Shell Centre Math Tasks & Lessons
- "Would You Rather" Math

Where can I go next for more task discussion?

- Makeover Mondays @ blog.mrmeyer.com
- Twitter: #probchat #mathchat #MTBoS

WHY: Why adapt pre-existing tasks?

Goals: Use pre-existing tasks for **ideas** and **ensuring content understanding**; modify to **make problems more accessible** and **raise cognitive demand**

HOW: Task analysis

Protocol: Likes/Wonders/Strategy

Goals: Develop **common vocabulary** and shared understanding around **quality tasks**

WHAT: Adapting pre-existing problems

Nine methods for adapting problems

Additional Notes:

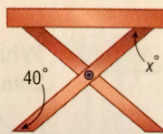
WHY

HOW

WHAT

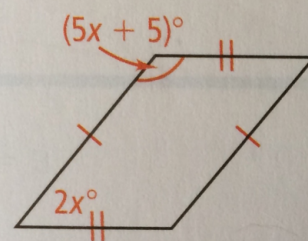
Sample Tasks to Analyze / Adapt

- ★ 24. **CARPENTRY** Anthony is building a picnic table for his patio. He cut one of the legs at an angle of 40° . At what angle should he cut the other end to ensure that the top of the table is parallel to the ground? Explain. **See margin.**



Geometry Find the value of x

61.



54. **Open-Ended** Give a counterexample to show that $(x + y)^2 = x^2 + y^2$ is false.

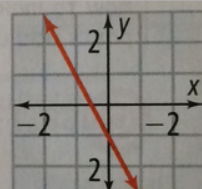
61. Which equation represents the line that passes through $(5, -8)$ and is parallel to the line at the right?

(F) $y = 2x + 2$

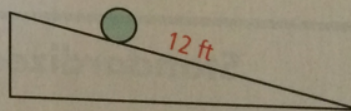
(H) $y = -2x$

(G) $y + 2x = 2$

(I) $y - 2x = 2$



50. **Physics** The equation $d = \frac{1}{2}at^2$ gives the distance d that an object starting at rest travels given acceleration a and time t . Suppose a ball rolls down the ramp shown at the right with acceleration $a = 2 \text{ ft/s}^2$. Find the time it will take the ball to roll from the top of the ramp to the bottom. Round to the nearest tenth of a second.



55. **Online Video Games** Angie and Kenny play online video games. Angie buys 1 software package and 3 months of game play. Kenny buys 1 software package and 2 months of game play. Each software package costs \$20. If their total cost is \$115, what is the cost of one month of game play?

1. A house has a 500-cubic-foot propane tank to provide gas to its appliances. The family uses an average of 0.95 cubic foot per day. Use the information to answer the following questions:

a. Write an equation for the number of cubic feet of gas in the tank after t days.

b. To the nearest cubic foot, how much gas will have been used in 45 days?

c. To the nearest day, how long will it take for the entire tank to be used up?

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Now it's your turn!

Share your task adaptations and ideas at emergentmath.com/nctm_adaptation.