

Lesson 40: Algebra Test

**Weekly Focus:** algebra test  
**Weekly Skill:** application

**LESSON 40: Algebra Test and One Application**

**Lesson Summary:** For the warm up, students will solve a problem comparing labor costs. Activity 1 is a test on the algebra unit. The application activity is about price discounts. Estimated time for the lesson is 2 hours.

**Materials Needed for Lesson 40:**

- *Mathematical Reasoning Test Preparation for the 2014 GED Test Student Book (pages 88 – 91)*
- Warm up handout
- Algebra Application Activity with answers (attached)
- Teacher Note:
  - The application activity should be downloaded directly from the site [yummymath.com](http://yummymath.com) by each site coordinator or teacher. <https://www.yummymath.com/2014/how-much-should-you-spend-on-this-sale/>

**Objectives:** Students will be able to:

- Solve a comparison of costs word problem
- Solve various algebra problems as a unit review
- Compare and graph percent discount in the application activity

**ACES Skills Addressed:** N, CT, ALS

**CCRS Mathematical Practices Addressed:** Building Solution Pathways, Mathematical Fluency, Reason Abstractly and Quantitatively

**Levels of Knowing Math Addressed:** Pictorial, Abstract, and Application

**Notes:**

**You can add more examples if you feel students need them before they work. Any ideas that concretely relates to their lives make good examples.**

**For more practice as a class, feel free to choose some of the easier problems from the worksheets to do together. The “easier” problems are not necessarily at the beginning of each worksheet. Also, you may decide to have students complete only part of the worksheets in class and assign the rest as homework or extra practice.**

The GED Math test is 115 minutes long and includes approximately 46 questions. The questions have a focus on quantitative problem solving (45%) and algebraic problem solving (55%).

Students must be able to understand math concepts and apply them to new situations, use logical reasoning to explain their answers, evaluate and further the reasoning of others, represent real world problems algebraically and visually, and manipulate and solve algebraic expressions.

This computer-based test includes questions that may be multiple-choice, fill-in-the-blank, choose from a drop-down menu, or drag-and-drop the response from one place to another.

The purpose of the GED test is to provide students with the skills necessary to either further their education or be ready for the demands of today's careers.

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**Lesson 40 Warm-up: Solve the cost comparison problem**

**Time: 10 Minutes**

Use the attached handout or project on the board:

Brandon is paying an electrician a \$30 service fee and \$40 per hour for work done at his home. He is also paying a plumber according to the table below.

Plumber Hours Worked	Total Cost
1 hour	\$55
2 hours	\$110
3 hours	\$165
4 hours	\$220

Basic Question: Choose the statement that is not true.

1. For 1 hour of work, the plumber charges less than the electrician.
2. For 2 hours of work, the plumber and the electrician cost the same amount.
3. For 3 hours of work, the electrician is more expensive than the plumber.
4. For 4 hours of work, the electrician costs less than the plumber.

Extension Questions:

- Write 2 equations to represent how much the plumber and the electrician charge.

Hint for students: Make a table of what the electrician charges to make comparison easier.

*Answers: #3 is false because for 3 hours the electrician costs \$150.*

*Equation for plumber:  $f(x) = 55x$  (or  $y = 55x$ ). For electrician:  $f(x) = 30 + 40x$*

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**Lesson 40 Activity 1: Algebra Test**

**Time: 75-90 Minutes**

1. Use problems 35-71 on **pages 88 to 91** of the **student book** as a test. Do not use the problems on pages 84 to 87 as these were done for review in a previous lesson.
2. Students may need up to 1 hour to take the test.
3. Collect the tests; correct them if the site coordinator advises or have students correct their own tests.
4. Go over the answers together as a class.

**Lesson 40 Algebra Application: How much discount?**

**Time: 20-30 Minutes**

1. This activity can be done in class, as homework or as an extra practice assignment.
2. Download [the activity](#) from [yummymath.com](http://yummymath.com). A copy is attached for reference.
3. This activity is a real-life application that includes percent computation, a table, graphing, equations, and critical thinking.
4. Start by projecting the sales flyer on the board.
5. Discuss what it means to have 25%, 30%, or 40% off. Can you figure this out in your head when you are shopping? (Yes, if you can do 10%, you can do the others.)
6. Let students do the problems independently. Encourage them to make a table to help.
7. Ask volunteer students to write their solutions on the board.
8. Do the cost and price equations together if there is time. (See answer sheet.)

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**Warm-up Problem**

Brandon is paying an electrician a \$30 service fee and \$40 per hour for work done at his home. He is also paying a plumber according to the table below.

Plumber Hours Worked	Total Cost
1 hour	\$55
2 hours	\$110
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Question: Choose the statement that is not true.

1. For 1 hour of work, the plumber charges less than the electrician.
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4. For 4 hours of work, the electrician costs less than the plumber.

Extension Question:

- Write 2 equations to represent how much the plumber and the electrician charge.

Percent Discount Application

IN STORES ONLY

the  
**BIGGEST  
LITTLE**  
SEMI-ANNUAL  
event

**DON'T MISS OUT!**  
**BUY MORE, SAVE MORE**  
FIND A STORE

SPEND  
\$75 get  
**25% OFF**

SPEND  
\$100 get  
**30% OFF**

SPEND  
\$125 get  
**40% OFF**

**Hurry!**  
**Ends Sunday, 3/3.**

Certain restrictions apply. See store associate for details.

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**Discounts**

Name \_\_\_\_\_

1. Looking at the sales graphic, what questions do you have (a summary of the sale is below)?

Spend \$75 and receive 25% off
Spend \$100 and receive 30% off
Spend \$125 and receive 40% off

2. How much would the following purchases cost after taking the appropriate discount?

a. Cargos for \$40



b. A sweater for \$70.



c. Jeans and a shirt totaling \$80

d. Jeans, sweatshirt and t-shirt for \$100

e. A coat for \$98.



f. Coat, t-shirt and shoes for \$130.

3. Are there certain purchase amount situations where you can actually spend more and as a result pay less? If so, find the purchase amounts for which this is true.

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Application **Answers**

**Discounts**

1. Looking at the sales graphic, what questions do you have (a summary of the sale is below)?

Spend \$75 and receive 25% off
Spend \$100 and receive 30% off
Spend \$125 and receive 40% off

2. How much would the following purchases cost after taking the appropriate discount?

a. Cargos for \$40

\$70 = no discount

b. A sweater for \$70. \$40 = no discount



c. Jeans and a shirt totaling \$80

75% of 80 = \$60



d. Jeans, sweatshirt and t-shirt for \$100

70% of \$100 = \$70

e. A coat for \$98.

75% of 98 = \$67.50

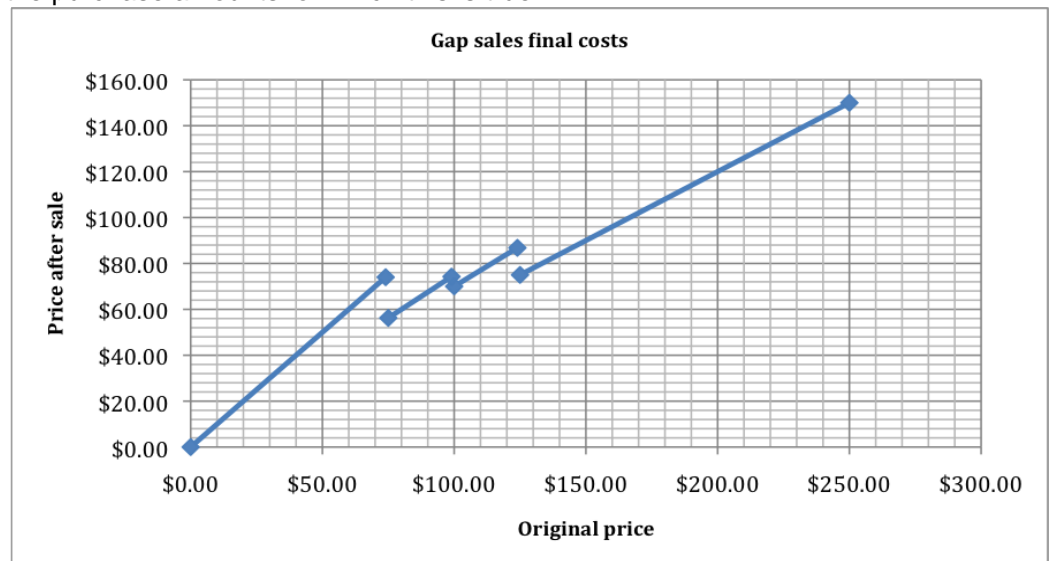


f. Coat, t-shirt and shoes for \$130.

60% of \$130 = \$78

3. Are there certain purchase amount situations where you can actually spend more and as a result pay less? If so, find the purchase amounts for which this is true.

cost	with discount
\$10.00	\$10.00
\$20.00	\$20.00
\$30.00	\$30.00
\$40.00	\$40.00
\$50.00	\$50.00
\$60.00	\$60.00
\$70.00	\$70.00
\$74.99	\$74.99
\$75.00	\$56.25
\$80.00	\$60.00
\$90.00	\$67.50
\$99.99	\$74.99
\$100.00	\$70.00
\$110.00	\$77.00
\$120.00	\$84.00
\$124.99	\$87.49
\$125.00	\$75.00
\$130.00	\$78.00
\$140.00	\$84.00



! If you are close to spending \$75, you could spend up to a \$100 and still pay less than \$75 at the cash register. So buy more. When is  $75 < .75 * P$ ? Spend up to \$100 and still pay no more than \$75.!

! From my chart I can see that if I were close to buying \$100 worth of goods, I could buy more and still pay less than the \$74.99 that my just less than \$100 purchase would have cost.!!!

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If I am close to buying items that would total to \$125 (which would cost me at most \$87.49 if just under \$125), I could spend \$145.82 (when  $1.6 * P = \$87.49$ ) and still have to pay about \$87.49.

!

!

Linear Programming!

$$\$75 \leq C < \$100$$

$$P = 75\% \text{ of } C$$

$$\$100 \leq C < \$125$$

$$P = 70\% \text{ of } C$$

$$\$125 \leq C$$

$$P = 60\% \text{ of } C$$

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