



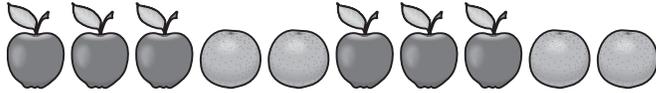
**NEW ENGLAND
COMMON ASSESSMENT PROGRAM**

**Released Items
Support Materials
2005**

**Grade 7
Mathematics**

NECAP 2005 RELEASED ITEMS
GRADE 7 MATHEMATICS

- 11 Look at these oranges and apples.



What is the ratio of oranges to apples?

Scoring Guide:

Score	Description
1	correct answer, 2 to 3 , $\frac{2}{3}$, or equivalent
0	Response is incorrect or contains some correct work that is irrelevant to the skill or concept being measured.
Blank	no response

NECAP 2005 RELEASED ITEMS
GRADE 7 MATHEMATICS

SCORE POINT 1 (EXAMPLE A)

$$\frac{4}{6}$$

Student gives answer equivalent
to $\frac{2}{3}$.

SCORE POINT 0 (EXAMPLE A)

$$\frac{4}{10}$$

Student's answer is incorrect.

SCORE POINT 0 (EXAMPLE B)

The ratio is 6 apples : 4 oranges

Student's answer is incorrect.
(Student reverses ratio.)

**NECAP 2005 RELEASED ITEMS
GRADE 7 MATHEMATICS**

- 12 The manager of a restaurant uses the formula below to decide what to charge for a meal.

$$p = (f \div 3) \times 10$$

In the formula, p is the price, in dollars, that customers pay for a meal and f is the food cost to make the meal.

What is the price of a meal if the food cost is \$4.50?

Scoring Guide:

Score	Description
1	correctly finds the price, \$15.00 or 15.00 or 15
0	Response is incorrect or contains some correct work that is irrelevant to the skill or concept being measured.
Blank	no response

NECAP 2005 RELEASED ITEMS
GRADE 7 MATHEMATICS

SCORE POINT 1 (EXAMPLE A)

\$15.00

Student's answer is correct.

SCORE POINT 0 (EXAMPLE A)

\$45.00

\$4.50
x 10

\$45.00

Student's answer is incorrect.

SCORE POINT 0 (EXAMPLE B)

The price of the meal would be \$13.50 if the food cost \$4.50.

Student's answer is incorrect.

**NECAP 2005 RELEASED ITEMS
GRADE 7 MATHEMATICS**

- 13 What is the greatest whole number value of n that makes this sentence true?

$$3^n < 100$$

Show your work or explain how you know.

Scoring Guide:

Score	Description
2	correct answer, 4 , and indication of correct work or explanation
1	correct answer without acceptable explanation, or response shows some understanding of exponents and bases
0	Response is incorrect or contains some correct work that is irrelevant to the skill or concept being measured.
Blank	no response

Sample Response:

4; $3^4 = 81$, $3^5 = 243$ (higher exponents give results more than 243)

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GRADE 7 MATHEMATICS

SCORE POINT 2 (EXAMPLE A)

$3^4 < 100$

$3 * 3 * 3 * 3 * 3$
9
27
81
243 > 100

Student's answer is correct with work shown.
(2 points)

SCORE POINT 2 (EXAMPLE B)

4 is the greatest whole number value.

$3^2 = 9$
 $3^3 = 27$
 $3^4 = 81$

Any higher than 3^4 would equal over 100 and make the statement $3^n < 100$ false.

Student's answer is correct with an appropriate explanation. (2 points)

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GRADE 7 MATHEMATICS

SCORE POINT 1 (EXAMPLE A)

3 ($3^3 < 100$) If the exponent is any number larger than 3 then the number would be larger than 100. I found this by trying different exponents:

My Work:

$$3 \times 3 = 9 \times 3 = 27 \times 3 = 81 \times 3 = 243$$

After I hit 243 I knew the exponent had to be 3.

Student's response shows some understanding of exponents and bases (1 point) but answer is incorrect because exponents are one less than they should be (0 points).

SCORE POINT 1 (EXAMPLE B)

N would have to be at most 4. I started with $3 \times 3 = 6$.
 $\times 6$ is that is 4 threes so far. 54×3 is over 100, (164).
 $\times 3$ $\times 3$
 $\frac{18}{54}$ that means the answer is 4.

Student's answer is correct (1 point) but explanation contains computational errors (0 points).

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SCORE POINT 0 (EXAMPLE A)

The greatest that n can be is 1, because 3¹ is equal to 30 and 30 is less than 100. If you did 3², it equals 300 and 300 is not less than 100.

right: $3^1 < 100$ or $30 < 100$

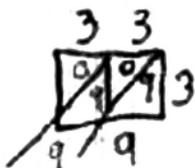
wrong: $3^2 < 100$ or $300 < 100$

Student's answer is incorrect and explanation does not demonstrate understanding of exponents and bases. (0 points)

SCORE POINT 0 (EXAMPLE B)

$n = 33$

$3^{33} = 99 < 100$



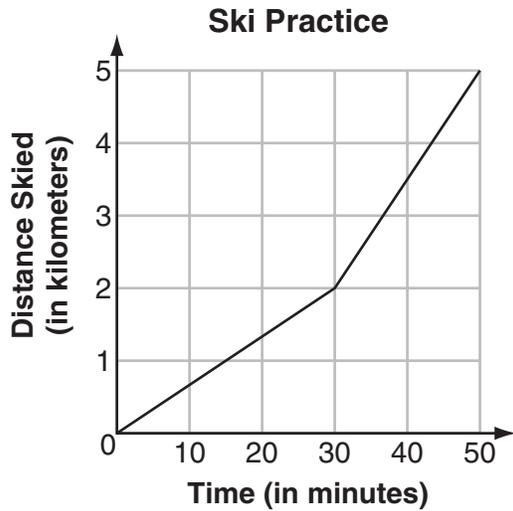
Saying the number has to be whole you can't use decimals.

99 is the closest I could get to with a multiple of 3

Student's answer is incorrect and explanation does not demonstrate understanding of exponents and bases. (0 points)

**NECAP 2005 RELEASED ITEMS
GRADE 7 MATHEMATICS**

- 14 The graph below shows the distance Ben skied during a 50-minute practice.



How does Ben's speed during the last 20 minutes of the practice compare with his speed during the first 30 minutes? Explain your answer.

Scoring Guide:

Score	Description
2	correct answer and explanation
1	correct answer OR incorrect or missing answer with explanation indicating understanding of relation of slope and speed
0	Response is incorrect or contains some correct work that is irrelevant to the skill or concept being measured.
Blank	no response

Sample Responses:

During the last 20 minutes Ben skied faster than during the first 30 minutes.

This can be seen by the graph segment for the last part being steeper, meaning he covered more distance in a given amount of time.

OR

During the last 20 minutes Ben skied faster than during the first 30 minutes since Ben skied 2 kilometers in 30 minutes but 3 kilometers in only 20 minutes.

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GRADE 7 MATHEMATICS

SCORE POINT 2 (EXAMPLE A)

Ben's speed in the last 20 minutes was a lot faster than his first 30 minutes, mainly because in the first $\frac{1}{2}$ hour Ben only went 2 kilometers; but in the last 20 minutes he went 3 kilometers.

Student's answer is correct with appropriate explanation. (2 points)

SCORE POINT 2 (EXAMPLE B)

His speed gets faster. This is because the slope of the line is steeper (/) in the last 20 minutes than the slope of the line (\) in the first 30 minutes. Just look at the graph.

Student's answer is correct with appropriate explanation. (2 points)

NECAP 2005 RELEASED ITEMS
GRADE 7 MATHEMATICS

SCORE POINT 1 (EXAMPLE A)

Ben increases his speed and goes faster than he did before.

Student's answer is correct (1 point) with no explanation (0 points).

SCORE POINT 0 (EXAMPLE A)

In the first 30 minutes of the practice Ben seemed to be skiing fast and descending at a rapid rate however in the last 20 minutes of the practice turn Ben seemed to be moving slower and descending at a slower rate.

Student's answer and explanation are incorrect. (0 points)

NECAP 2005 RELEASED ITEMS
GRADE 7 MATHEMATICS

SCORE POINT 0 (EXAMPLE B)

Ben was at about 1.5 km at
20 min. Then at 30 mins. His speed
went to 2 km. So Ben's speed went
up by .5 km.

Student's answer and explanation are
incorrect. (0 points)

**NECAP 2005 RELEASED ITEMS
GRADE 7 MATHEMATICS**

- 15 Cal said, “All squares are similar to each other.”
- a. Explain how you know whether Cal is or is not correct.

Stu said, “All rectangles are similar to each other.”

- b. Draw two rectangles that prove that Stu’s statement is **false**. Explain your answer.

Scoring Guide:

Score	Description
4	4 points
3	3 points
2	2 points
1	1 point OR Student shows minimal understanding of similar figures.
0	Response is incorrect or contains some correct work that is irrelevant to the skill or concept being measured.
Blank	no response

Training Notes:

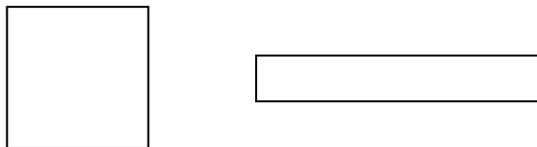
- Part a: 2 points for correct answer and full explanation
OR
1 point for correct answer and partial explanation
- Part b: 2 points for correct drawings and explanation
OR
1 point for correct drawings without acceptable explanation

NECAP 2005 RELEASED ITEMS
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Sample Response:

Part a: Cal is correct. All squares have 4 right angles and 4 sides of equal length, so corresponding sides are proportional.

Part b:



The sides of these rectangles are not proportional

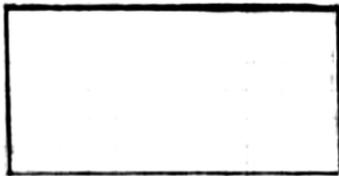
Note: In part b, accept any two rectangles that have ratios of sides that are not equal.

NECAP 2005 RELEASED ITEMS
GRADE 7 MATHEMATICS

SCORE POINT 4 (EXAMPLE A)

a) Cal is correct because all squares have to have 4 equal length sides and all four corners must be 90° angles.

b.



Some rectangles ratios, length and width, are very different.

a) Student's explanation is complete—addresses proportional sides and congruent angles. (2 points)

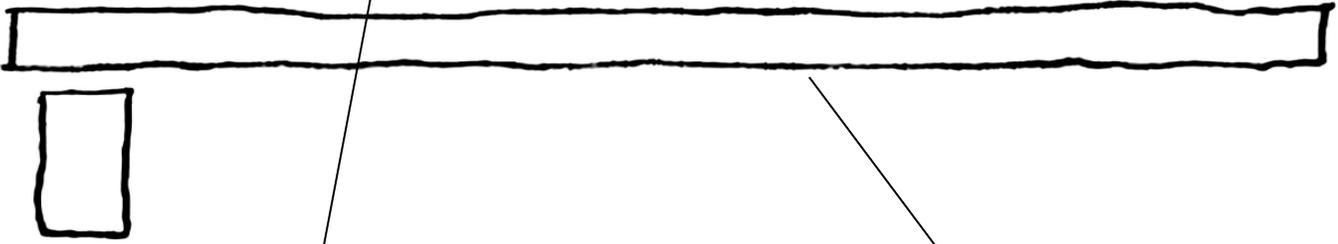
b) Student gives correct drawing and an appropriate explanation. (2 points)

NECAP 2005 RELEASED ITEMS
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SCORE POINT 3 (EXAMPLE A)

a. She is correct because they all have 4 sides the same length
and 4 right angles

b.



a) Student's explanation is complete—
addresses proportional sides and
congruent angles. (2 points)

b) Student gives correct drawing
without explanation. (1 point)

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GRADE 7 MATHEMATICS

SCORE POINT 2 (EXAMPLE A)

a) Squares are similar to each other because all squares have equal sides.

b)

a) Student gives a partial explanation—addresses proportional sides but not congruent angles. (1 point)

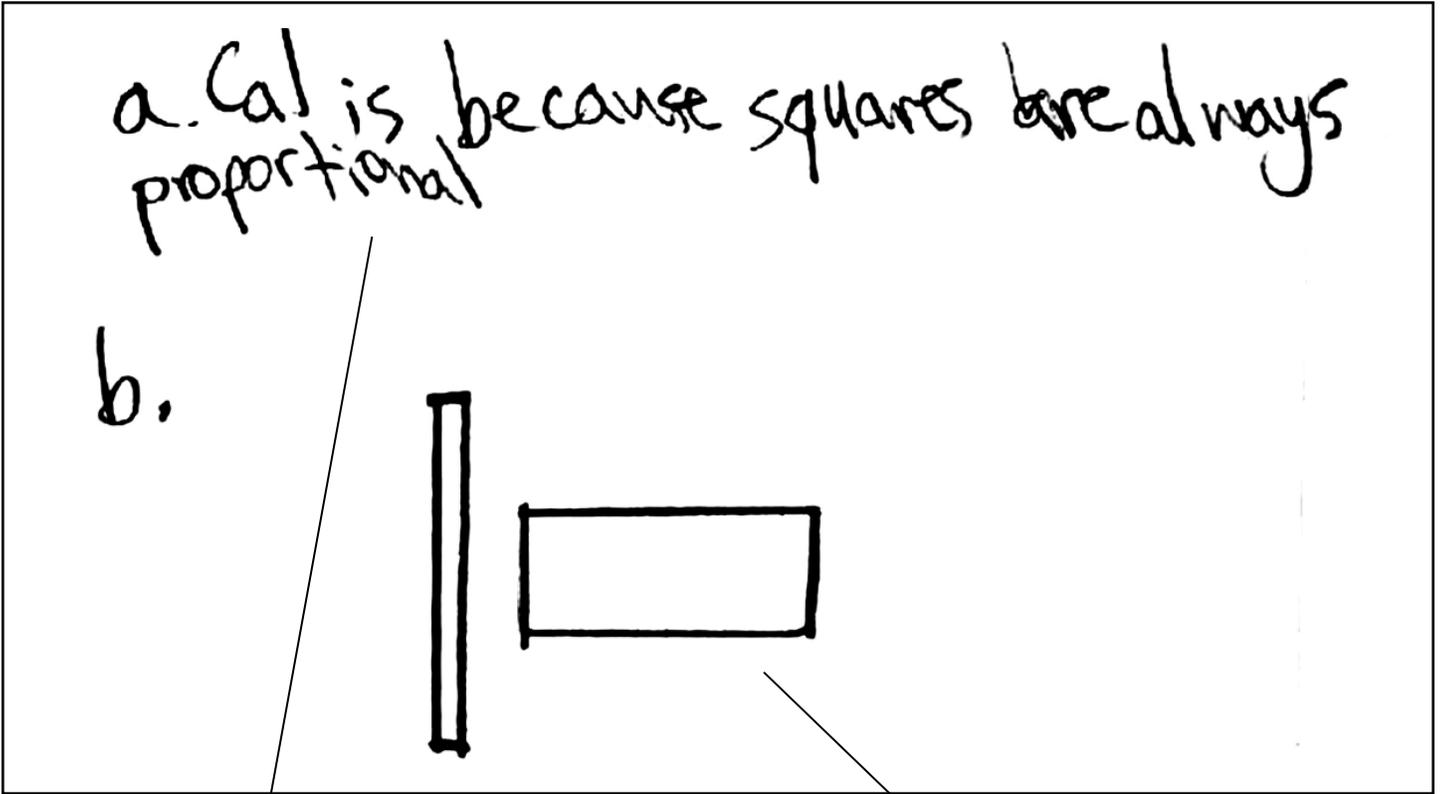


False

b) Student gives correct drawing without explanation. (1 point)

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SCORE POINT 2 (EXAMPLE B)



a) Student gives a partial explanation. (1 point)

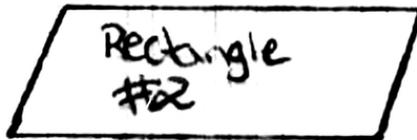
b) Student gives correct drawing without explanation. (1 point)

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SCORE POINT 1 (EXAMPLE A)

A: Cal is correct Because all Squares
have to have 4 Sides and all the Sides
have to be the Same Size and they
have to be Paralell.

B:



a) Student gives a partial explanation—
addresses proportional sides but not
congruent angles. (1 point)

b) Student's drawing is incorrect.
(0 points)

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GRADE 7 MATHEMATICS

SCORE POINT 0 (EXAMPLE A)

A. Cal is right because all squares are equal.
B.

a) Student's explanation is vague. (0 points)



He is wrong because rectangles can be straight or diagonal.

b) Student's drawing is incorrect. (0 points)

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SCORE POINT 0 (EXAMPLE B)

(A) I know that squares are all different shapes and sizes so Cal is incorrect because squares are all not the same.

(B)  Not all rectangles are the same. So Stu is wrong because rectangles are not all the same.

a) Student's response is incorrect.
(0 points)

b) Student's drawing is incorrect.
(0 points)