# MATHLETICS 8TH GRADE 2014

Team # _____

## Question #1
## 2 minutes, 2 points

**Problem 1** **2 points** **2 minutes**

Helen just got a new bike with a speedometer on the handlebar. The speedometer can tell Helen the distance she travels and her average speed for a trip.

On one trip, Helen rode 4 km in the first 10 minutes and then 2 km in the next 5 minutes. What was Helen's average speed?

**ANSWER:** _____

Adapted from http://www.oecd.org/pisa/test/form/

# MATHLETICS 8TH GRADE 2014

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## Question #2
## 2 minutes, 2 points

**Problem 2** **2 points** **2 minutes**

It's 2014 and Chris just received her first car driver's license. She wants to buy a car, so she created a table of information on the 4 cars she finds at a local dealer. Use this information to find:

A. On average, which car has been driven the least per year ?
(# of years = 2014 - year in question)

B. What is that lowest average kpy (kilometer per year) to the nearest km?

| Model: | Alpha | Bolte | Castel | Dezal |
|---|---|---|---|---|
| Year | 2003 | 2000 | 2001 | 1999 |
| Advertised price (zeds) | 4800 | 4450 | 4250 | 3990 |
| Distance travelled (kilometres) | 105 000 | 115 000 | 128 000 | 109 000 |
| Engine capacity (litres) | 1.79 | 1.796 | 1.82 | 1.783 |

**ANSWERS:**

**_____has been driven the least per year.**

**_____kpy is the lowest average.**

Adapted from http://www.oecd.org/pisa/test/form/

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## Question #3
## 2 minutes, 2 points

**Problem 3** **2 points** **2 minutes**

Express the following statement mathematically and simplify the expression.

"Five eighths 'x' plus one and one third is subtracted from one and one fourth 'x' minus five and one sixth."

**ANSWER:** _____

Adapted from http://www.edinformatics.com/testing/new_york_state/grade-7-math.pdf

# MATHLETICS 8TH GRADE 2014

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## Question #4
## 2 minutes, 2 points

**Problem 4** **2 points** **2 minutes**

At a discount furniture store, Chris offered a salesperson $600 for a couch and a chair. The offer includes the 8% sales tax. If the salesperson accepts the offer, what would be the **price of the furniture**, to the nearest dollar **before tax?**

**ANSWER:** _____

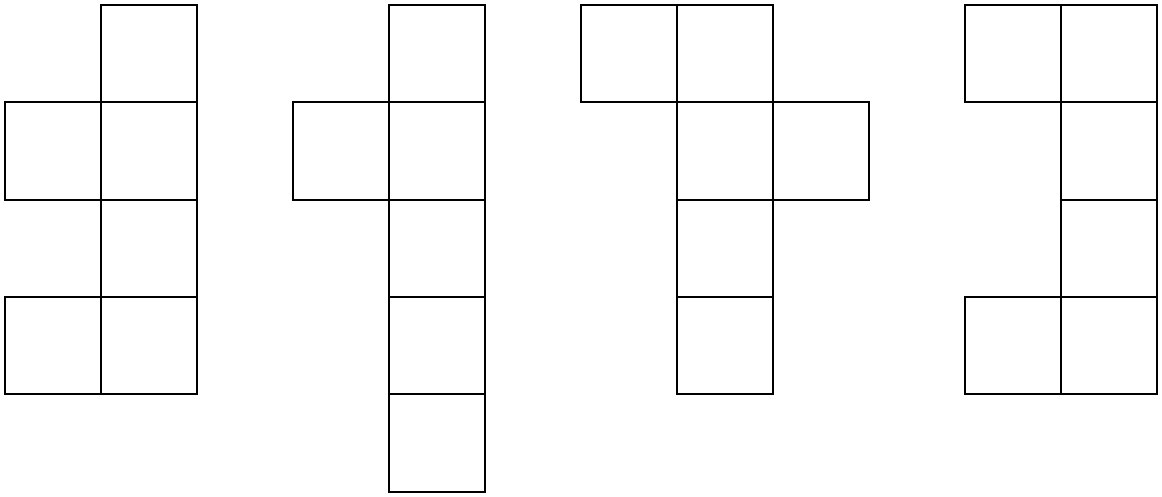
Adapted from http://www.edinformatics.com/testing/new_york_state/grade-7-math.pdf

# MATHLETICS 8TH GRADE 2014

Team # _____

## Question #5
## 1 minute, 1 point

**Problem 5** **1 point** **1 minute**



**A** **B** **C** **D**

Which nets, if cut out on the perimeter and folded on the lines, could result in a cube?

**ANSWER: _____**

# MATHLETICS 8TH GRADE 2014

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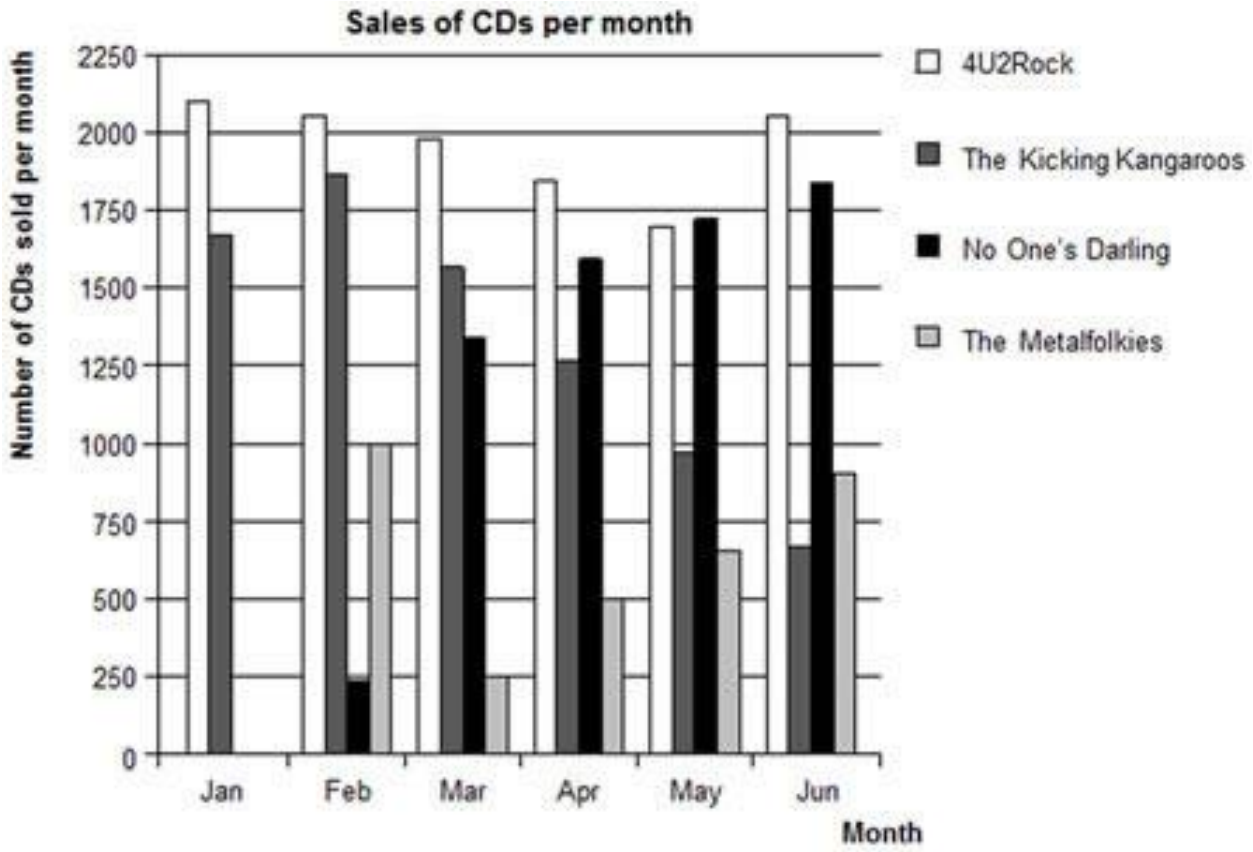
## Question #6
## 1 minute, 1 point

**Problem 6** **1 point** **1 minute**

In January, the new CDs of the bands 4U2Rock and The Kicking Kangaroos were released. In February, the CDs of the bands No One's Darling and The Metalfolkies followed. The following graph shows the sales of the bands' CDs from January to June. The Coding legend to the right is in the same order as the bars in the chart (Feb thru Jun).

**Question:**

In **which month** did the band “No One's Darling” sell more CDs than the band “The Kicking Kangaroos” for the first time?




**ANSWER:** _____

Adapted from http://www.oecd.org/pisa/test/form/

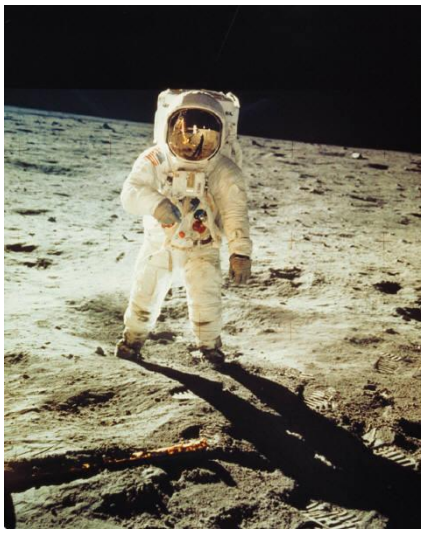
# MATHLETICS 8TH GRADE 2014

Team # _____

## Question #7
## 2 minutes, 2 points

**Problem 7** **2 points** **2 minutes**

A framed picture 24 inches wide and 28 inches high is shown in the diagram below.



The picture will be hung on a wall where the distance from the floor to ceiling is 8 feet. The center of the picture must be 5¼ feet from the floor. Determine the **distance from the ceiling to the top of the picture frame**.

**ANSWER:** _____

Adapted from http://www.edinformatics.com/testing/new_york_state/grade-7-math.pdf

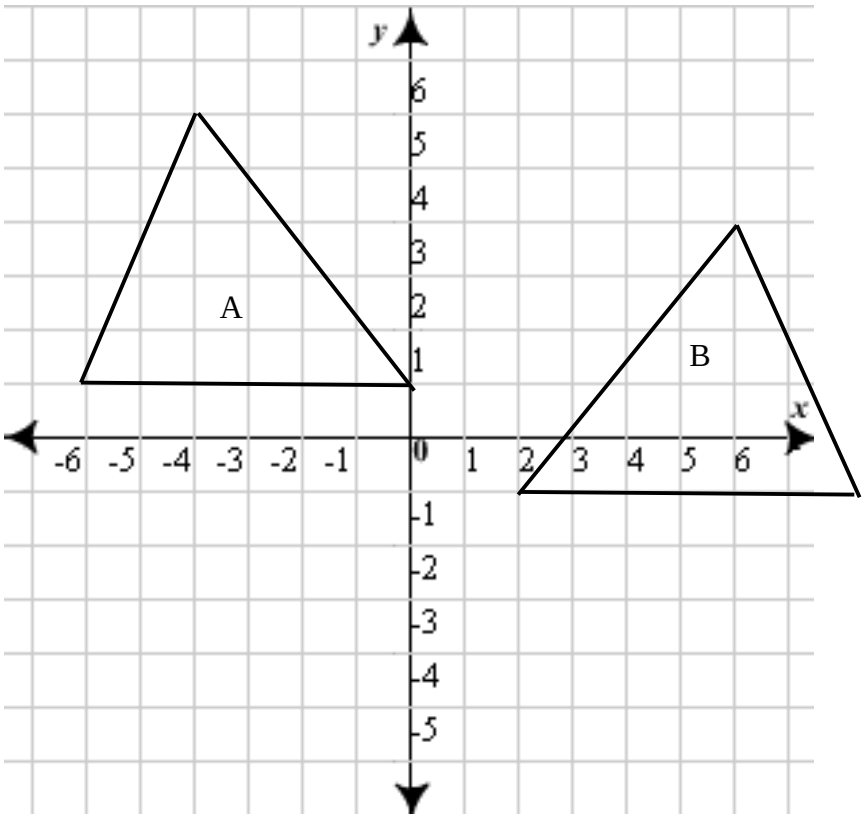
# MATHLETICS 8TH GRADE 2014

Team # _____

## Question #8
## 2 minutes, 2 points

**Problem 8** **2 points** **2 minutes**

What is the sequence of transformations that takes Triangle A to its Image, Triangle B?




**ANSWER:** _____

**followed by** _____

Adapted from
http://www.engageny.org/sites/default/files/resource/attachments/grade_8_math_released_questions.pdf

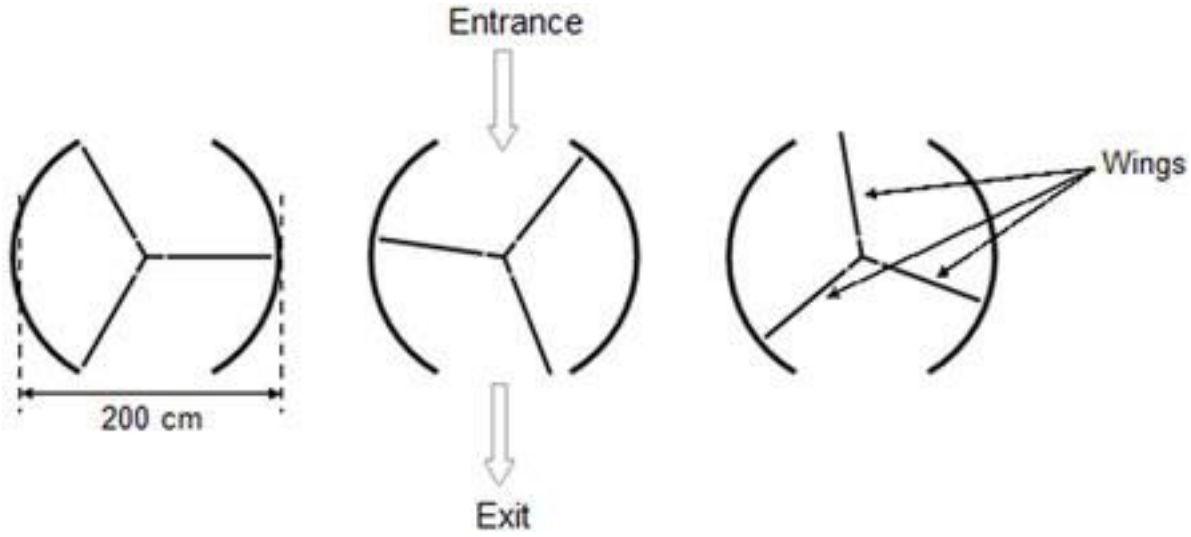
# MATHLETICS 8TH GRADE 2014

Team # _____

## Question #9
## 3 minutes, 3 points

**Problem 9** **3 points** **3 minutes**

A revolving door includes three wings which rotate within a circular-shaped space. The inside diameter of this space is 2 meters (200 centimeters). The three door wings divide the space into three equal sectors. The plan below shows the door wings in three different positions viewed from the top.




The door makes 4 complete rotations in a minute. There is room for a maximum of two people in each of the three door sectors.

What is the maximum **number of people** that can enter the building through the door in 30 minutes?

**ANSWER:** _____

Adapted from http://www.oecd.org/pisa/test/form/

# MATHLETICS 8TH GRADE 2014

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## Question #10
## 3 minutes, 3 points

**Problem 10** **3 points** **3 minutes**

While on vacation, a group can rent bicycles and scooters by the week. They get a reduced rental rate if they rent 5 bicycles for every 2 scooters rented. The reduced rate per bicycle is $15.50 per week and the reduced rate per scooter is $160 per week. The sales tax on each rental is 12%.

The group has $1600 available to spend on bicycle and scooter rentals. What is the greatest number of bicycles and the greatest number of scooters the group can rent if the ratio of bicycles to scooters is 5:2?

**ANSWER: _____bicycles and**

**_____ scooters**

Adapted from www.edinformatics.com/testing/new_york_state/grade-7-math.pdf

# MATHLETICS 8TH GRADE 2014

Team # _____

## Question #11
1 minute, 1 point

**Problem 11** **1 point** **1 minute**

Factor to determine which expression is equal to:

$$\frac{4}{3}x + 4\frac{2}{3}$$

A $\frac{4}{3}(x+2)$

B $\frac{1}{3}(4x+6)$

C $\frac{2}{3}(2x+4)$

D $\frac{2}{3}(2x+7)$

**ANSWER:** _____

Adapted from http://www.edinformatics.com/testing/new_york_state/grade-7-math.pdf

# MATHLETICS 8TH GRADE 2014

Team # _____

## Question #12
## 2 minutes, 2 points

**Problem 12** **2 points** **2 minutes**

When John bought his new computer, he purchased an On-line Computer Help Service. The help service has a yearly fee of $25.50 and a $10.50 charge for each help session a person uses. If John can only spend $170 for the computer help this year, what is the **maximum number of help sessions** he can use this year?

A **Bonus Point** for correctly expressing the inequality that represents this transaction.

**ANSWER:** _____

**Bonus:** _____

Adapted from http://www.edinformatics.com/testing/new_york_state/grade-7-math.pdf

# MATHLETICS 8TH GRADE 2014

Team # _____

## Question #13
## 1 minute, 1 point

**Problem 13** **1 point** **1 minute**

Simplify:

$$\frac{4^{8}}{4^{-4}}$$

**ANSWER:** _____

Adapted from
http://www.engageny.org/sites/default/files/resource/attachments/grade_8_math_released_questions.pdf

# MATHLETICS 8TH GRADE 2014

Team # _____

## Question #14
## 2 minutes, 2 points

**Problem 14** **2 points** **2 minutes**

During an experiment, the two spinners below will be spun.
Y = Yellow, G = Green, B = Blue, R = Red

Spinner A 


Spinner B 


Optional Abbreviations:
Spinner A (Green, Blue, Red, Yellow) – (G,B,R,Y)
Spinner B (1, 2, 3, 4, 5, 6)

Represent the sample space: (G,1) etc. for this experiment to determine the probability of a **Green <u>and</u>** an **Odd** number. Report your answer to the nearest tenth of a percent.

**ANSWER:** _____

Adapted from http://www.edinformatics.com/testing/new_york_state/grade-7-math.pdf
http://schoolmart.com/ProductImages/ler/LER-0147.jpg

# MATHLETICS 8TH GRADE 2014

Team # _____

## Question #15
## 2 minutes, 2 points

**Problem 15** **2 points** **2 minutes**

A scale drawing for a construction project uses a scale of 1 inch = 4 feet. The dimensions of the rectangular warehouse space on the scale drawing are 7.5 inches by 12 inches.

If flooring is installed at $3.25 per square foot, what will be the cost of the flooring in the warehouse after the construction project is completed?

**ANSWER:** _____

Adapted from www.edinformatics.com/testing/new_york_state/grade-7-math.pdf

# MATHLETICS 8TH GRADE 2014

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## Question #16
## 3 minutes, 3 points

**Problem 16** **3 points** **3 minutes**

Mount Fuji is a famous dormant volcano in Japan.

The Gotemba walking trail up Mount Fuji is about 9 kilometers (km) long. Walkers need to return from the 18 km walk by 8 pm.

Toshi estimates that he can walk up the mountain at 1.5 kilometers per hour on average, and down at twice that speed. These speeds take into account meal breaks and rest times.

Using Toshi's estimated speeds, what is the latest time he can begin his walk so that he can return by 8 pm?

**ANSWER:** _____

Adapted from http://www.oecd.org/pisa/test/form/

# MATHLETICS 8TH GRADE 2014

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## Question #17
## 2 minutes, 2 points

**Problem 17** **2 points** **2 minutes**

Solve for all values of x:

$$2(x-3)^2+5=77$$

**ANSWER: _____**

# MATHLETICS 8TH GRADE 2014

Team # _____

## Question #18
## 1 minute, 1 point

**Problem 18** **1 point** **1 minute**

Solve:

$$2(x-3)=2x+5$$

**ANSWER:** _____

**ANSWER KEY**

1. 4 km / 10 min. = 2 km / 5 min. = 6*4 km / 6*10 min. = **24 km / hr**

2. Alpha: 105,000 km / 11y = 9,545 kpy
   Bolte: 115,000 km / 14y = 8,214 kpy
   Castel: 128,000 km / 13 y = 9,846 kpy
   **Dezal: 109,000 km / 15 y = 7,267 kpy**

3. $1\frac{1}{4}x - 5\frac{1}{6} - \left(\frac{5}{8}x + 1\frac{1}{3}\right)$

$$\frac{5}{4}x - \frac{31}{6} - \frac{5}{8}x - \frac{4}{3} = \frac{10}{8}x - \frac{31}{6} - \frac{5}{8}x - \frac{8}{6} = \frac{5}{8}x - \frac{39}{6}$$

$$= \frac{5}{8}x - 6\frac{3}{6} = \mathbf{\frac{5}{8}x - 6\frac{1}{2}} = 0.625x - 6.5$$

   either reduced form of the correct answer is acceptable

4. **$ 552.00**

5. **Net C** only

6. **April**

7. **$1\frac{7}{12}$ feet, 1 foot 7 inches, or 19 inches**

8. **A reflection over the line x = 2, and translation down 2 units.**

9. **720 people (721 people will be allowed as a correct answer, too.)**

10. **15 bicycles and 6 scooters**

The student may find the cost of 5 bikes plus tax = $86.80 and the cost of 2 scooters plus tax = $358.40 for a total of $445.20, $\frac{1600}{445.20}$ = 3.59, so 3 groups of 5 bikes and 2 scooters = 15 bikes and 6 scooters.

11 **D**

12. **13 Sessions**

**Bonus Point** $0.5x + 25.50 \leq 170$

13. **$4^{12}$ = 16,777,216**
either form of the correct answer is acceptable.
$4^8 / 4^{-4} = 4^8 * 4^4 =$ **$4^{12}$ = 16,777,216**

14. **Sample Space:**

| | | | |
|---|---|---|---|
| **(Green, 1)** | (Blue, 1) | (Red, 1) | (Yellow, 1) |
| (Green, 2) | (Blue, 2) | (Red, 2) | (Yellow, 2) |
| **(Green, 3)** | (Blue, 3) | (Red, 3) | (Yellow, 3) |
| (Green, 4) | (Blue, 4) | (Red, 4) | (Yellow, 4) |
| **(Green, 5)** | (Blue, 5) | (Red, 5) | (Yellow, 5) |
| (Green, 6) | (Blue, 6) | (Red, 6) | (Yellow, 6) |

**3** Elements out of 24 meet the criterion Green and Odd which makes 3/24 = 1/8 = .125 = 12.5%. The answer should be written to the nearest tenth of a percent.

15. **$4680**

If the dimensions of the warehouse on the scale drawing are 7.5 inches by 12 inches, the dimensions of the actual room will be 30 feet by 48 feet. Therefore, the actual area of the warehouse will be 30 x 48 = 1440 square feet. The cost is **1440 Square Feet x 3.25 = $4680.**

16. **11 AM**

18 km = 9 km up + 9 km down
9 km / 1.5 kph = 6 hours
9 km / 3 kph = 3 hrs
Total time (up + down) = 9 hours.
9 hours before 8 PM is 11 AM

17. **-3 and 9**

$2(x - 3)^2 + 5 = 77$
$2(x - 3)^2 = 72$
$(x - 3)^2 = 36$
$(x - 3) = 6$ and $(x - 3) = -6$
$x = 9$ $x = -3$

18. **There is no solution.** The student correctly determined the simplest form of the given equation is in the form of a = b, where a and b are different numbers. The student who selects this response may have simplified the given linear equation to 0 = 11 and interpreted that solution to mean that the equation has no solution.

$2 ( x - 3 ) = 2 x + 5$
$2 x - 6 = 2 x + 5$
$2 x = 2 x + 5 + 6$
$2 x = 2 x + 11$
$2 x - 2 x = 11$
**0 = 11 ???!!! NO Solution!**