

Math Orientation Test

Name: _____

1. Houston Housing Market:

CATEGORIES	DECEMBER 2010	DECEMBER 2011	PERCENT CHANGE
Total property sales	5,122	5,460	6.6%
Total dollar volume	\$1,079,022,599	\$1,159,956,192	7.5%
Total active listings	49,005	42,083	-14.1%
Total pending sales	2,821	2,907	3.0%
Single-family home sales	4,295	4,604	7.2%
Single-family average sales price	\$220,479	\$219,791	-0.3%
Single-family median sales price	\$157,000	\$160,000	1.9%
Months inventory*	7.2	5.8	-20.2%

* Months inventory estimates the number of months it will take to deplete current active inventory based on the prior 12 months sales activity. This figure is representative of the single-family homes market.

Source: <http://www.worldpropertychannel.com/north-america-residential-news/houston-housing-market-report-homes-for-sale-in-houston-condos-for-sale-in-houston-houston-association-of-realtors-har-homebuyer-tax-credit-distressed-home-sales-5198.php>

Show the calculation to demonstrate how the -0.3% change between December 2010 and 2011 of single-family average sales price is obtained.

- If you have to spend 70% of your available income for renting a room in a student hostel and the price of the hostel is 140 Euro, how high is your available income?
- If the amount of a lottery jackpot is 1,300,000 and the amount of all winnings together is 1,950,000, how high is the percentage of the jackpot out of all prizes?
- Job rotation:
There are two manufacturing machines producing plastic toys in a factory. Both machines have to be calibrated as soon as they are stopped and need one employee each for monitoring them. During the production process employees cannot leave the machine.
 - Calibration of the first machine takes 16 minutes and needs 2 minutes for producing one plastic toy.
 - Calibration of the second machine takes 7 minutes and needs 3 minutes for producing one plastic toy.

Now the employer wants to initiate an exchange of employees between the two machines as often as possible throughout a day. How many toys should be produced during one production round that both employees produce the same number of toys in one production round and none of them has to wait for the other one to finish producing the same number of toys as a matter of fairness?

Hint: The number of toys has to be that one for which the first and the second machine need the same time to produce an equal number of toys calibration included once.

5. Simplify: $2x^2 - 2x = ?$ For which x is the expression equal to zero?

6. $|-7| = ?$

7. Which of the following equations is true?

$$1/(1/4) = 0.25$$

$$(2/4) * x = 0.5x$$

$$x/5 = 0.2x$$

$$(3x)^3 = 27x$$

$$a^5 a^2 = a^{10}$$

$$a^2 + a^5 = a^7$$

8. Does the point $(-4, -7)$ lie on the line $y = 3x + 5$?

9. If $2x + y = 10$, and $-3x + 3y = 12$, what are x and y , then?

10. If an amount of 3500 € brings 2% per annum (e.g., on an account at a bank), how much is gained after 4 years (with interest and interest on interest)?

11. You plan a holiday trip from Austria to USA. Therefore you have to change some Euro into US\$. The exchange rate between the Austrian Euro and the US \$ is:

$$1 \text{ Euro} = 1.28123 \text{ USD}$$

A friend tells you that you should have a minimum amount of 500 USD with you when you arrive at the airport in the USA.

How many Euros do you have to pay for the 500 USD?

12. If $-5 = (1/2x) + 8$, how much is x ?

13. Rearrange the equation $\sqrt{\frac{4}{x^2}} - 3 = 6y$ so that it has the form $x = \dots$

14. Multiply: $(x-4)^2 =$

15. Give a sketch of $y = x - 2$ in a coordinate system.

16. At the Grand Prix de Monaco, a formula one race, the drivers have to drive 78 rounds with an overall distance of 260.520 km. The pole position driver has an accident at kilometer number 170. In which round did he have his accident?

LINK LIST:

Percent

<http://www.math.com/school/subject1/lessons/S1U1L7GL.html>

Percent, fractions, decimals

<http://www.mathgoodies.com/tutorial/>

(Unit: Understanding Percent, Math tutorial – free: 1. The Meaning of Percent, 2. Writing Fractions as Percents, 3. Challenge Exercises)

Percent and Proportions

<http://www.mathgoodies.com/tutorial/>

(Unit: Percent applications, Math tutorial – free: 1. Percent and Proportion, 2. Percent Change)

Exponents

<http://www.math.com/school/subject1/lessons/S1U1L8GL.html>

Roots

<http://www.math.com/school/subject1/lessons/S1U1L9GL.html>

Ratios and Proportions

<http://www.math.com/school/subject1/lessons/S1U2L2GL.html>

Graphs (bar, line, circle)

http://www.mathgoodies.com/lessons/graphs/bar_graph.html

(bottom of the page – Lessons on Data and Graphs – go through the sessions)

Algebra

<http://www.anlyzemath.com/Equations/equations.html>

(Equations)

http://www.anlyzemath.com/Equations/literal_equations.html

(Literal Equations)

http://www.anlyzemath.com/Equations/equations_square_root.html

(Solve Equations with Square Root)

http://www.anlyzemath.com/Equations/linear_Eq_Tutorial.html

(Solving Linear Equations)