Test 2
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Math 097

Name: key

All truths are easy to understand once they are discovered; the point is to discover them.

Galileo Galilei (1564 - 1642)
Italian astronomer

No work = no credit

Warm-ups (1 pt each): $(-2)^2 =$ 4 $\quad -2^2 =$ -4 $\quad \frac{2}{0} =$ und

1.) (2 pts) Solve: $\frac{3x}{4} - \frac{1}{3} = 1 - \frac{2}{3}\left(x - \frac{1}{6}\right)$.

$\Rightarrow \frac{3x}{4} - \frac{1}{3} = 1 - \frac{2}{3}x + \frac{2}{18}$

$\Rightarrow 27x - 12 = 36 - 24x + 4$ $\Rightarrow 51x = 52$

Solution: $x = 52/51$

2.) (4 pts) Simplify $\sqrt{27x^6y^5}$

Solution: $3x^3y^2\sqrt{3y}$

3.) (4 pts) Simplify $\sqrt[3]{-6 \cdot 8}$

Solution: $-2\sqrt[3]{6}$

4.) (4 pts) Find $\left(5+\sqrt{10}\right)\left(7-\sqrt{10}\right)$

$35 - 5\sqrt{10} + 7\sqrt{10} - 10$

Solution: $25 + 2\sqrt{10}$

5.) (1 pt) Simplify $8+3\sqrt{2}$

Solution: $8 + 3\sqrt{2}$

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6.) (4 pts) Simplify $\frac{9}{2+\sqrt{6}}$

$\frac{9}{2+\sqrt{6}} \cdot \frac{2-\sqrt{6}}{2-\sqrt{6}} = \frac{9(2-\sqrt{6})}{4-6}$

Solution: $\frac{-9(2-\sqrt{6})}{2}$

7.) (4 pts) Simplify $\sqrt[5]{-96}$

$= \sqrt[5]{-3 \cdot 2^5}$

Solution: $-2\sqrt[5]{3}$

8.) (4 pts) Simplify $\sqrt{\frac{108w^5y^{11}}{6w}}$

$= \sqrt{18w^4y^{11}}$

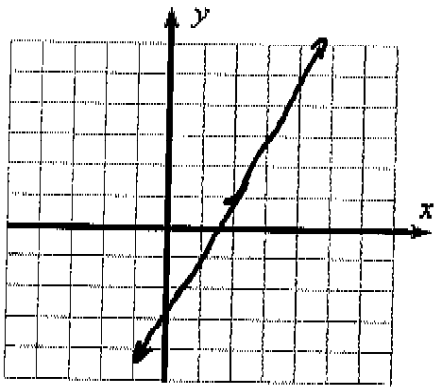
Solution: $3w^2y^5\sqrt{2y}$

9.) (4 pts) Simplify $\left(\frac{a^{\frac{3}{4}}}{7b^{-5}}\right)^{-2}$

$= \frac{a^{-3/2}}{7^{-2}\,b^{10}}$

Solution: $\frac{49}{a^{3/2}\,b^{10}}$

10.) (2 pts) Graph $y-1=2(x-2)$



(4 pts)

11.) Write $x^{\frac{1}{7}} \cdot x^{\frac{3}{7}} \cdot x^{\frac{2}{7}}$ using a single radical (that is, without rational exponents).

$x^{6/7}$

Solution: $\sqrt[7]{x^6}$ or $\left(\sqrt[7]{x}\right)^6$

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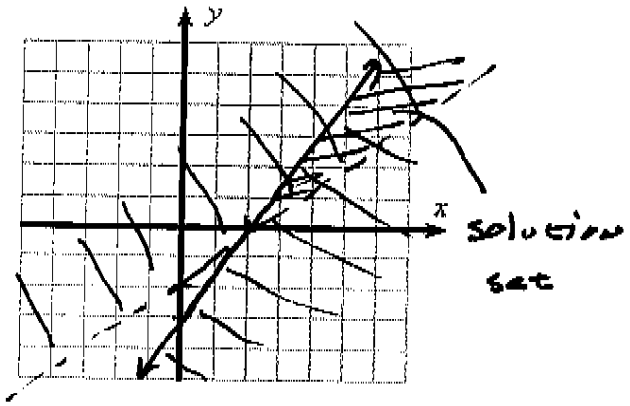
12.) (2 pts) Solve: $|x|+2 \geq 5$

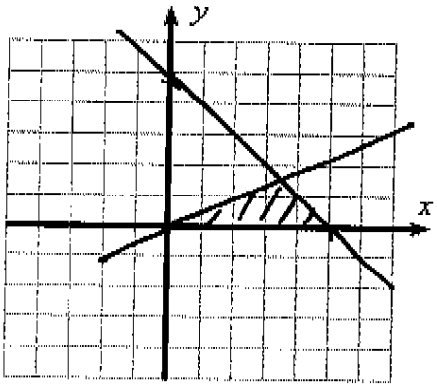
$\Rightarrow |x| \geq 3$

Solution: $x \leq -3$ or $x \geq 3$

13.) (8 pts) Carefully graph the system of inequalities and clearly shade the solution set.



a.) $\begin{cases} 3x-2y \geq 6 \\ x-y<2 \end{cases}$



b.) $\begin{cases} x \geq 2y \\ x+y \leq 5 \\ x \geq 0 \\ y \geq 0 \end{cases}$

14.) (2 pts) Solve: $-4+5|2x-4|<36$.

$\Rightarrow 5|2x-4| < 40$

$\Rightarrow |2x-4| < 8$

$\Rightarrow -8 < 2x-4 < 8$

$-4 < 2x < 12$

Solution: $-2 < x < 6$

15.) 4 pts) Manuel owed a total of $4200 on his two credit cards for one year. He paid a total of $706 in interest. If the annual rate on one card was 14% and the annual rate on the other card was 18%, how much did he owe on each card?

List the quantities to be found. Use English phrases/sentences. Do not solve.

x = Amt owed @ 14%

y = Amt owed @ 18%

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16.) (4 pts) Wei has a solution that is 25% antifreeze and a solution that is 65% antifreeze. How much of each should he use to obtain 12 liters of solution that is 59% antifreeze.

Set up a system of linear equations that describe the problem. Do not solve.

x = # of L of 25% sol

y = # of L of 65% sol

Solution: $\begin{cases} x + y = 12 \\ .25x + .65y = .59(12) \end{cases}$

17.) (4 pts) Mo decides to hold a garage sale. In his change box he has a total of 56 nickels and dimes worth $4.40. How many of each type of coin does he have? Express your answer using complete sentences.

n = # of nickels d = # of dimes

$$\begin{cases} n + d = 56 \\ 5n + 10d = 440 \end{cases}$$

$$-5n - 5d = -280$$

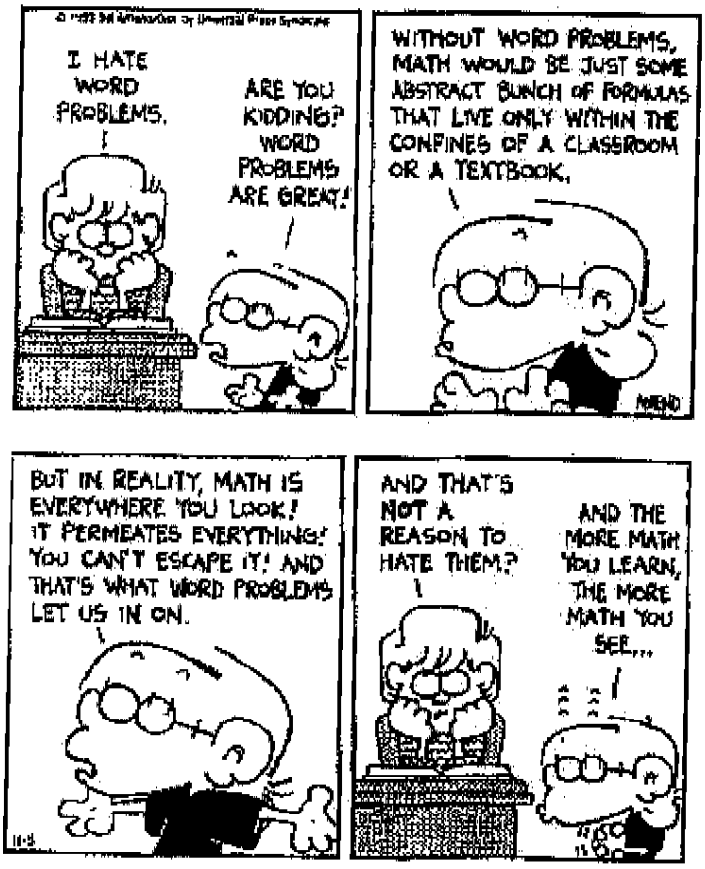
$$5d = 160$$

$$d = 32$$

AND $n = 24$

Mo has 24 nickels and 32 dimes.

Fox Trot



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