

Test 2 (retake)
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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):

$0^0 = \text{undef}$

$-5^2 = -25$

$\frac{3}{0} = \text{undef}$

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

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

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

$\rightarrow 51x = 52$
Solution: $x = 52/51$

2.) (4 pts) Simplify $\sqrt{24x^9y^8}$

Solution: $2x^4y^4\sqrt{6x}$

3.) (4 pts) Simplify $\sqrt[3]{-4 \cdot 27}$

Solution: $-3\sqrt[3]{4}$

4.) (4 pts) Find $(2 + \sqrt{7})(3 - 4\sqrt{7})$

$$6 - 8\sqrt{7} + 3\sqrt{7} - 4 \cdot 7$$

Solution: $-22 - 5\sqrt{7}$

5.) (1 pt) Simplify $6 + 2\sqrt{5}$

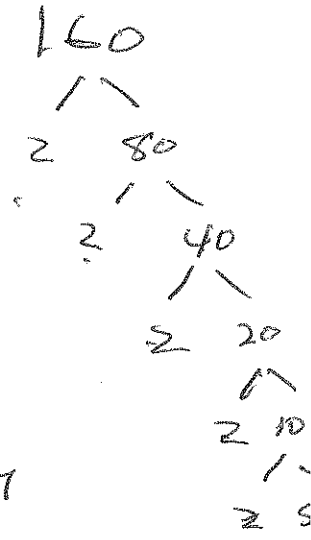
Solution: $6 + 2\sqrt{5}$

6.) (4 pts) Simplify $\frac{5}{3-\sqrt{7}} \cdot \frac{3+\sqrt{7}}{3+\sqrt{7}}$

$$\frac{15 + 5\sqrt{7}}{9 - 7}$$

Solution: $\frac{15 + 5\sqrt{7}}{2}$

7.) (4 pts) Simplify $\sqrt[3]{-160}$



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

8.) (4 pts) Simplify $\sqrt{\frac{120w^{12}y^{15}}{5w^4}}$

$$= \sqrt{24w^8y^{15}}$$

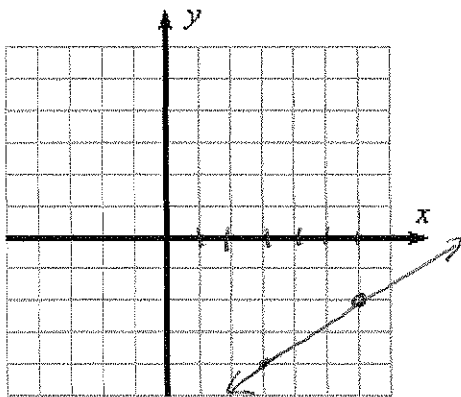
Solution: $2w^4y^7\sqrt{6y}$

9.) (4 pts) Simplify $\left(\frac{a^{\frac{2}{3}}}{2 \cdot b^{-7}}\right)^{-4}$. (Write with all positive exponents)

$$= \frac{a^{-8/3}}{2^{-4} b^{28}}$$

Solution: $\frac{16}{a^{8/3} b^{28}}$

10.) (2 pts) Graph $y + 2 = \frac{2}{3}(x - 6)$



11.) (4 pts) Write $x^{\frac{2}{9}} \cdot x^{\frac{4}{9}} \cdot x^{\frac{1}{9}}$ using a single radical (that is, without rational exponents).

$$x^{7/9}$$

Solution: $\sqrt[9]{x^7}$

12.) (2 pts) Solve: $4|2x-3| \geq 44$

$$|2x-3| \geq 11$$

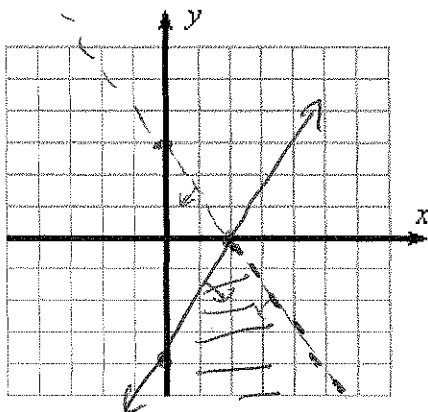
$$2x-3 \geq 11 \text{ OR } 2x-3 \leq -11$$

$$2x \geq 14 \text{ OR } 2x \leq -8$$

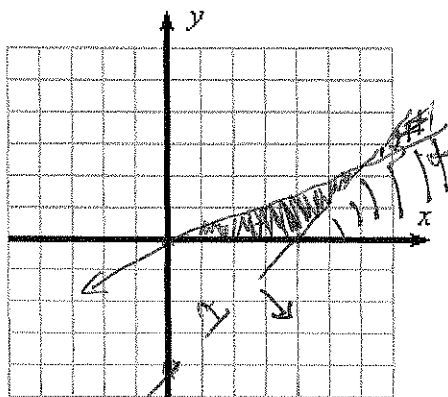
$$x \geq 7 \text{ OR } x \leq -4$$

Solution: _____

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



a.) $\begin{cases} 3x+2y < 6 \\ 2x-y \geq 4 \end{cases}$



b.) $\begin{cases} x \geq 3y \\ x - y > 4 \\ x \geq 0 \\ y \geq 0 \end{cases}$

14.) (2 pts) Solve: $4|3x+6| - 8 < 28$.

$$4|3x+6| < 36$$

$$\Rightarrow |3x+6| < 9$$

$$\Rightarrow -9 < 3x+6 < 9$$

$$-15 < 3x < 3$$

$$-5 < x < 1$$

Solution: _____

15.) 4 pts) Tanya wants to make 20 pounds of a snack mix that she can sell for \$2.44 per pound. If she has chocolate covered raisins that sell for \$2.80 per pound and peanuts that sell for \$2.00 per pound, how much of each should she use?

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

R = # lbs of chocolate covered raisins
P = # lbs of peanuts.

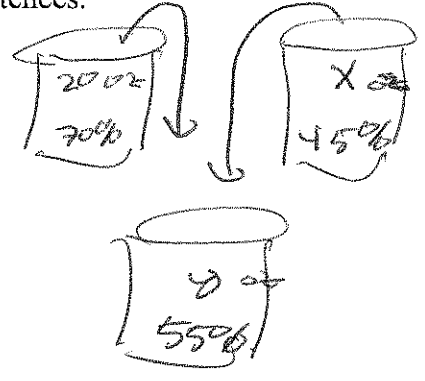
16.) (4 pts) Sophia has a total of \$2475 in two different ~~savings~~ ^{her checking} accounts. Last year, ~~one savings~~ ^{one checking} account paid 3% interest and the ~~other~~ ^{savings} account paid 6.5% interest. If she earned \$116.25 in interest for the year, how was her money divided between the two accounts?

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

$C = \text{Amt in checking}$
 $S = \text{Amt in savings}$

$$\begin{cases} C + S = 2475 \\ .03C + .065S = 116.25 \end{cases}$$
 Solution: _____

17.) (4 pts) Dion has 20 ounces of a 70% salt solution. How many ounces of 45% salt solution should he add to obtain a solution that is 55% salt? Express your answer using complete sentences.



$$\begin{cases} 20 + X = y \\ 20(.7) + .45X = .55y \end{cases}$$

$$\Rightarrow 14 + .45X = .55(20 + X)$$

$$\qquad \qquad \qquad = 11 + .55X$$

$$\Rightarrow 3 = .1X$$

$$\Rightarrow X = 30 \quad \& \quad y = 50$$

 Dion should
 use 30 oz of
 45% sol.

Fox Trot

