NC Math 2 - Released Items Solutions

Rational Exponents

1. (A) $\left(8w^{7}x^{-5}y^{3}z^{-9}\right)^{-2/3}$

move negative exponents to make them positive

$$\frac{8^{-2/3}\, w^{-14/3}\, x^{10/3}\, y^{-6/3}\, z^{18/3}}{8^{2/3}\, w^{14/3}\, y^{2}} = \frac{x^{10/3} z^{6}}{4w^{14/3}y^{2}}$$

2. Inverse -

(D)

$t = \frac{26.2}{s}$

INVERSE Variation

3. $F = \frac{K}{r^2}$ $K = F \cdot r^2$

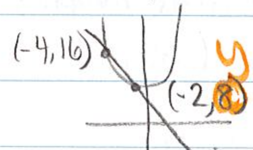
$K = 8.2(.64)^2$

$F = \frac{3.35872}{r^2}$ $K = 3.35872$

(B)

$F = 5.66$ Newton

4. Non-linear System



(C) 8 $y_1 = x^2+2x+8$

$y_2 = -4x$

Intersection

Smallest value of y.

$x=-2$ and $x=-4$

Need x and y $(-2,8)$ and $(-4,16)$

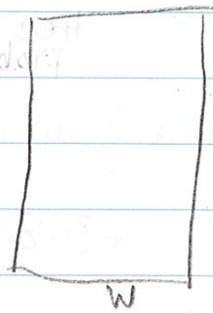
$x^2+2x+8 = -4x$

$x^2+6x+8=0$

$(x+4)(x+2)=0$

$x=-4$ | $x=-2$

5. C = Quadratic size



$2{,}050 = 50 + 10(2w^2)$

$\frac{2000}{20} = \frac{20w^2}{20}$

$\sqrt{100} = \sqrt{w^2}$

(D) $10 = w$

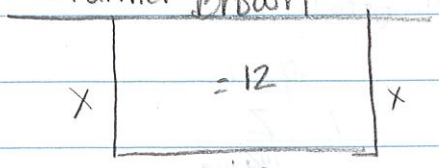
height is twice w = (20) max

Area - Quadratics

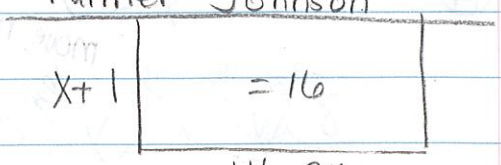
6. 12 meters.

(D)

Farmer Brown



Farmer Johnson



width	length	Area
1	10	10
1.5	9	13.5
2	8	16
2.5	7	17.5
3	6	18
3.5	5	17.5
4	4	16

x	width	length	Area
1	2	12	24
2	3	10	30
3	4	8	32
4	5	6	30
5	6	4	24

(D) $32 - 18 = 14\ m^2$

☆ 7. Probability

D) 0.74

conditional probability

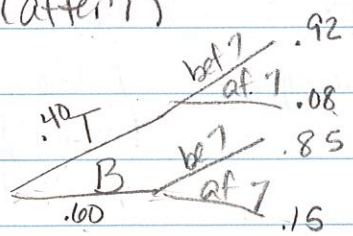
$P(A|B) = \frac{P(A \cap B)}{P(B)}$

P(Bus arrived home after 7:00pm) = .60 × .15

$\frac{P(B \cap \text{after 7})}{P(\text{after 7})} = (.60)($

$\frac{P(\text{and})}{P(\text{given})}$

(D) .74



$\frac{.60(.15)}{(.4)(.08) + (.6)(.15)}$

.032 .09

$\frac{.09}{.122} = .737$

tree diagram needed to see Prob. of given

8. $f(x) = 2x^2 - 3x + 5$ translated 8 units down

TRANSFORMATION

-8 $+5 - 8 = -3$

(A) A) $2x^2 - 3x - 3$

Completing the Square

9. $2x^2 + 5x = -12$

$2\left(x^2 - \frac{5}{2}x + \frac{25}{16}\right) = -12 + \frac{50}{16}$

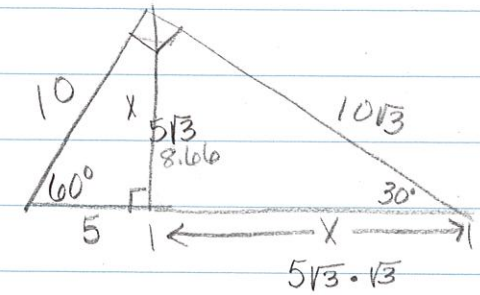
(B) $2\left(x - \frac{5}{4}\right)^2 \qquad \frac{-192}{16} + \frac{50}{16}$

$\frac{-142}{16}$

$2\left(x - \frac{5}{4}\right)^2 + \frac{142}{16} = 0$

$2\left(x - \frac{5}{4}\right)^2 + \frac{71}{8} = 0$

10.



(D)

Special right triangles or **Right Δ trig**

$\sin 60° = \frac{x}{10}$ $x = 8.66$

$\tan 30° = \frac{8.66}{x}$ $x = 14.9999$

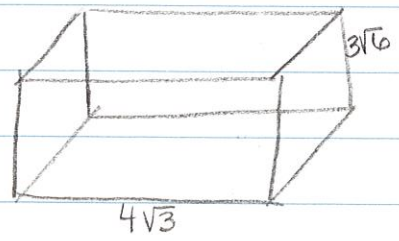
$x = 15$

$5\sqrt{9}$

$5 \cdot 3 = 15$

11. **REAL NUMBER System**

(B)



$V = l \cdot w \cdot h$

$V = 4\sqrt{3} \cdot 2\sqrt{50} \cdot 3\sqrt{6}$

$4\sqrt{3} \cdot (4\sqrt{12}) \cdot 3\sqrt{6}$

$4\sqrt{3} \cdot 5\sqrt{8} \cdot 3\sqrt{6}$

$4\sqrt{3} \cdot 7\sqrt{18} \cdot 3\sqrt{6}$

= Rational

$\sqrt{900} = 30$

$\sqrt{216}$ 14.69

Rational

$\sqrt{144} = 12$

Rational

$\sqrt{324} = 18$

B. irrational

lots of $\sqrt{}$ are

12. $y = x^2 - 6x + 9 + 10 - 9$ **Completing the Square**

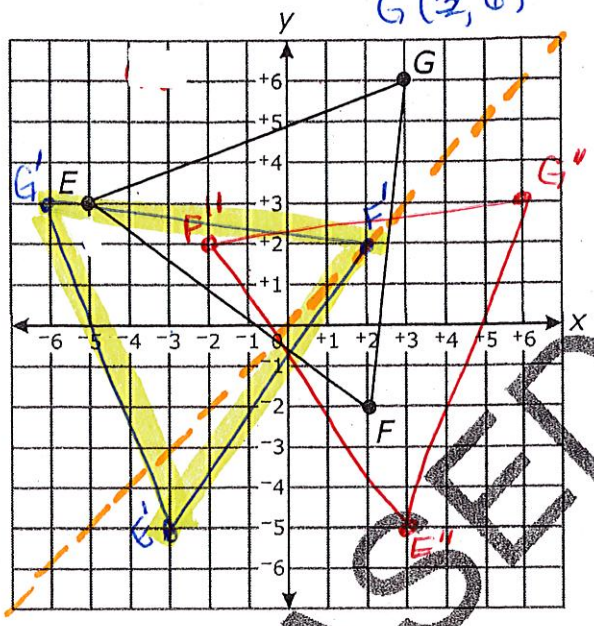
(B) $y = (x-3)^2 + 1$

E (-5,3)
F (2,-2)
G (3,6)

(x,y) → (-y, x)

E' (-3,-5)
F' (+2,2)
G' (-6,3)

13 Triangle *EGF* is graphed below.



Triangle *EGF* will be rotated 90° counterclockwise around the origin and will then be reflected across the *y*-axis, producing an image triangle. Which additional transformation will map the image triangle back onto the original triangle?

A rotation 270° counterclockwise around the origin

B rotation 180° counterclockwise around the origin

C reflection across the line $y = -x$

D reflection across the line $y = x$