AG – Unit 4 Retest REVIEW:
Polynomials and Radicals

Name _Hirsch_

Period _____ Date _____

Add, subtract, or multiply the following as indicated. Write your answer in standard form.

1. $(2x + 5) + (6x - 2)$

$\boxed{8X + 3}$

2. $(10x + 2) - (6x + 5)$

$10X + 2 - 6X - 5$

$\boxed{4X - 3}$

3. $(4x^2 - 8x + 1) + (3x^2 - 2x - 8)$

$\boxed{7X^2 - 10X - 7}$

4. $(x + 4)(2x - 8)$

$2X^2 - 8X$
$\quad +8X - 32$
_____

$\boxed{2X^2 - 32}$

5. $(x + 2)(x^2 + 5x + 4)$

$X^3 + 5X^2 + 4X$
$\quad 2X^2 + 10X + 8$
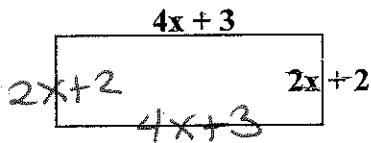_____

$\boxed{X^3 + 7X^2 + 14X + 8}$

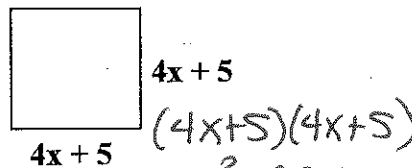6. $(7x^2 + 2x + 1) - (-5x^2 - 6x - 2)$

$7X^2 + 2X + 1 + 5X^2 + 6X + 2$

$\boxed{12X^2 + 8X + 3}$

Find the Perimeter or Area of the following:

10. Find the Perimeter:

$4x + 3$
$2x + 2$ ▭ $2x + 2$
$4x + 3$

$\boxed{12X + 10}$

11. Find the Area:

□ $4x + 5$

$4x + 5$

$(4x + 5)(4x + 5)$
$16X^2 + 20X$
$\quad\quad 20X + 25$
_____

$\boxed{16X^2 + 40X + 25}$

12. Find the Area:

$(x - 5)$

▭ $(3x - 4)$

$(x - 5)(3x - 4)$
$3X^2 - 4X - 15X + 20$
$\boxed{3X^2 - 19X + 20}$

13. Find the volume (no parentheses in answer).

$(3x + 1)$
$(x + 3)$
$(2x - 3)$
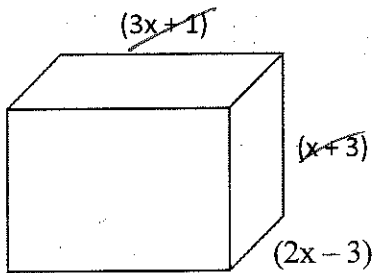
$(3x + 1)(x + 3)$
$3x^2 + 9x + 1x + 3$
$3x^2 + 10x + 3$
_____

$(2x - 3)(3x^2 + 10x + 3)$

$6x^3 + 20x^2 + 6x$
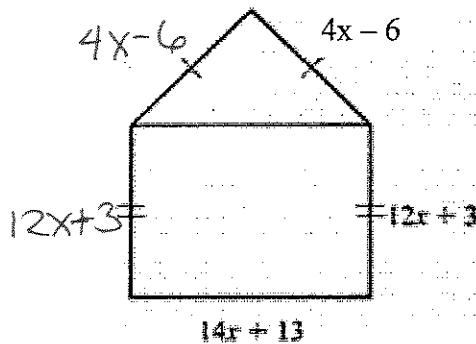$\quad - 9x^2 - 30x - 9$
_____

$\boxed{6x^3 + 11x^2 - 24x - 9}$

pick 2 and multiply

multiply the 3rd by answer you just got.

10. A model of a house is shown.

What is the perimeter, in units, of the model?

$\boxed{46x + 7}$

[Diagram of house with sides labeled: $4x-6$, $4x-6$, $12x+3$, $12x+3$, $14x+13$]

Add up all 5 sides. watch for negatives

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12. If $2x^2 - 5x + 7$ is subtracted from $4x^2 + 2x - 11$, what is the coefficient of x in the result?

Ⓐ 2

Ⓑ 7

Ⓒ –3

Ⓓ –18

$(4x^2 + 2x - 11) - (2x^2 - 5x + 7)$

$4x^2 + 2x - 11 - 2x^2 + 5x - 7$

$2x^2 + 7x - 18$

13. What is the resulting polynomial when $3x + 7$ is multiplied by $2x - 6$?

Ⓐ $5x + 1$

Ⓑ $6x - 42$

Ⓒ $6x^2 - 4x - 42$

Ⓓ $6x^2 + 9x - 42$

$(3x+7)(2x-6)$

$6x^2 - 18x$
$ + 14x - 42$
_____
$6x^2 - 4x - 42$

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14. Which of the following is an irrational number?

Ⓐ The sum of 3 and 0.111....

Ⓑ The product of $2\sqrt{3}$ and width $\dfrac{1}{\sqrt{3}}$

Ⓒ The product of $\sqrt{16}$ and $\sqrt{9}$

Ⓓ The sum of $\sqrt{3}$ and $0.\overline{3}$

Test in your calculator

15. Which of the following is not a rational number? *Looking for irrational.*

Ⓐ The product of 2 and $0.\overline{3}$

Ⓑ The sum of $2 + \sqrt{3}$ and $5 - \sqrt{3}$

Ⓒ The sum of $\dfrac{3}{7}$ and $\dfrac{1}{2}$

Ⓓ The product of 2 and $\sqrt{2}$

Will the end result be rational or irrational?

16. Irrational (Rational) *non-zero*

Irrational

17. Irrational + Irrational

Either $\;\begin{array}{l}ex.\ \sqrt{2}+\sqrt{3}=I\\ -\sqrt{2}+\sqrt{2}=R\end{array}$

18. Irrational (Irrational)

Either $\;\begin{array}{l}ex.\ \sqrt{2}\cdot\sqrt{3}=I\\ \sqrt{2}\cdot\sqrt{2}=R\end{array}$

Simplify the following Radicals without a calculator. No decimals allowed.

1. $\sqrt{8}$
$\boxed{2\sqrt{2}}$

2. $\sqrt{45}$
$\boxed{3\sqrt{5}}$

3. $\sqrt{28}$
$\boxed{2\sqrt{7}}$

4. $\sqrt{24}$
$\boxed{2\sqrt{6}}$

5. $\sqrt{72}$ $2 \cdot 3\sqrt{2}$
$\boxed{6\sqrt{2}}$

Rationalize the following without a calculator. No decimals allowed.

7. $\dfrac{1}{\sqrt{3}} \cdot \dfrac{\sqrt{3}}{\sqrt{3}}$
$\boxed{\dfrac{\sqrt{3}}{3}}$

8. $\dfrac{15}{\sqrt{5}} \cdot \dfrac{\sqrt{5}}{\sqrt{5}}$
$\dfrac{15\sqrt{5}}{5} = \boxed{3\sqrt{5}}$

9. $\dfrac{4}{\sqrt{2}} \cdot \dfrac{\sqrt{2}}{\sqrt{2}}$
$\dfrac{4\sqrt{2}}{2} = \boxed{2\sqrt{2}}$

10. $\dfrac{1}{\sqrt{12}} \cdot \dfrac{\sqrt{12}}{\sqrt{12}}$
$\dfrac{\sqrt{12}}{12} = \dfrac{2\sqrt{3}}{12} = \boxed{\dfrac{\sqrt{3}}{6}}$

11. $\dfrac{1}{3\sqrt{2}} \cdot \dfrac{\sqrt{2}}{\sqrt{2}}$
$\dfrac{\sqrt{2}}{3\sqrt{4}} = \dfrac{\sqrt{2}}{3 \cdot 2} = \boxed{\dfrac{\sqrt{2}}{6}}$