Name: _____

A.APR.A.1: Operations with Polynomials 3a

1 What is the product of $2r^2 - 5$ and $3r$?
1) $6r^3 - 15r$
2) $6r^3 - 5$
3) $6r^2 - 15r$
4) $6r^2 - 15$

2 What is the product of $-3x^2y$ and $(5xy^2 + xy)$?
1) $-15x^3y^3 - 3x^3y^2$
2) $-15x^3y^3 - 3x^3y$
3) $-15x^2y^2 - 3x^2y$
4) $-15x^3y^3 + xy$

3 What is the product of $(c + 8)$ and $(c - 5)$?
1) $c^2 + 3c - 40$
2) $c^2 - 3c - 40$
3) $c^2 + 13c - 40$
4) $c^2 - 40$

4 What is the product of $(3x + 2)$ and $(x - 7)$?
1) $3x^2 - 14$
2) $3x^2 - 5x - 14$
3) $3x^2 - 19x - 14$
4) $3x^2 - 23x - 14$

5 The expression $(x - 6)^2$ is equivalent to
1) $x^2 - 36$
2) $x^2 + 36$
3) $x^2 - 12x + 36$
4) $x^2 + 12x + 36$

6 The expression $\left(a^2 + b^2\right)^2$ is equivalent to
1) $a^4 + b^4$
2) $a^4 + a^2b^2 + b^4$
3) $a^4 + 2a^2b^2 + b^4$
4) $a^4 + 4a^2b^2 + b^4$

7 The expression $(2x + 1)^2 - 2(2x^2 - 1)$ is equivalent to
1) $4x + 3$
2) $2x + 3$
3) 3
4) -1

8 Which trinomial is equivalent to $3(x - 2)^2 - 2(x - 1)$?
1) $3x^2 - 2x - 10$
2) $3x^2 - 2x - 14$
3) $3x^2 - 14x + 10$
4) $3x^2 - 14x + 14$

9 What is the product of $x^2 - 2x + 3$ and $x + 1$?
1) $x^3 - x^2 + x + 3$
2) $x^3 - 2x^2 + 3x$
3) $x^2 - 3x + 2$
4) $x^2 - x + 4$

10 What is the product of $2x + 3$ and $4x^2 - 5x + 6$?
1) $8x^3 - 2x^2 + 3x + 18$
2) $8x^3 - 2x^2 - 3x + 18$
3) $8x^3 + 2x^2 - 3x + 18$
4) $8x^3 + 2x^2 + 3x + 18$

11 When $(2x - 3)^2$ is subtracted from $5x^2$, the result is
1) $x^2 - 12x - 9$
2) $x^2 - 12x + 9$
3) $x^2 + 12x - 9$
4) $x^2 + 12x + 9$

12 Fred is given a rectangular piece of paper. If the length of Fred's piece of paper is represented by $2x - 6$ and the width is represented by $3x - 5$, then the paper has a total area represented by
1) $5x - 11$
2) $6x^2 - 28x + 30$
3) $10x - 22$
4) $6x^2 - 6x - 11$

Name: _____

13 Chad had a garden that was in the shape of a rectangle. Its length was twice its width. He decided to make a new garden that was 2 feet longer and 2 feet wider than his first garden. If x represents the original width of the garden, which expression represents the difference between the area of his new garden and the area of the original garden?

1) $6x+4$
2) $2x^2$
3) x^2+3x+2
4) 8

14 The length of a rectangle is represented by x^2+3x+2, and the width is represented by $4x$. Express the perimeter of the rectangle as a trinomial. Express the area of the rectangle as a trinomial.

15 Express the product of $2x^2+7x-10$ and $x+5$ in standard form.

16 Write the expression $5x+4x^2(2x+7)-6x^2-9x$ as a polynomial in standard form.

17 What is the product of $\left(\frac{x}{4}-\frac{1}{3}\right)$ and $\left(\frac{x}{4}+\frac{1}{3}\right)$?

1) $\frac{x^2}{8}-\frac{1}{9}$
2) $\frac{x^2}{16}-\frac{1}{9}$
3) $\frac{x^2}{8}-\frac{x}{6}-\frac{1}{9}$
4) $\frac{x^2}{16}-\frac{x}{6}-\frac{1}{9}$

18 What is the product of $\left(\frac{2}{5}x-\frac{3}{4}y^2\right)$ and $\left(\frac{2}{5}x+\frac{3}{4}y^2\right)$?

1) $\frac{4}{25}x^2-\frac{9}{16}y^4$
2) $\frac{4}{25}x-\frac{9}{16}y^2$
3) $\frac{2}{5}x^2-\frac{3}{4}y^4$
4) $\frac{4}{5}x$

19 The expression $\left(\frac{3}{2}x+1\right)\left(\frac{3}{2}x-1\right)-\left(\frac{3}{2}x-1\right)^2$ is equivalent to

1) 0
2) $-3x$
3) $\frac{3}{4}x-2$
4) $3x-2$

20 If the difference $(3x^2-2x+5)-(x^2+3x-2)$ is multiplied by $\frac{1}{2}x^2$, what is the result, written in standard form?

21 Express $\left(\frac{2}{3}x-1\right)^2$ as a trinomial.

22 Express the product of $\left(\frac{1}{2}y^2-\frac{1}{3}y\right)$ and $\left(12y+\frac{3}{5}\right)$ as a trinomial.

A.APR.A.1: Operations with Polynomials 3a
Answer Section

1 ANS: 1 REF: 010819a
2 ANS: 1 REF: 060807ia
3 ANS: 1
$(c+8)(c-5) = c^2 - 5c + 8c - 40 = c^2 + 3c - 40$

REF: 060708a
4 ANS: 3
$(3x+2)(x-7) = 3x^2 - 21x + 2x - 14 = 3x^2 - 19x - 14$

REF: 061210ia
5 ANS: 3
$(x-6)^2 = (x-6)(x-6) = x^2 - 6x - 6x + 36 = x^2 - 12x + 36$

REF: 060015a
6 ANS: 3
$(a^2+b^2)^2 = (a^2+b^2)(a^2+b^2) = a^4 + a^2b^2 + a^2b^2 + b^4 = a^4 + 2a^2b^2 + b^4$

REF: 010430a
7 ANS: 1 REF: 088917siii
8 ANS: 4
$3(x^2 - 4x + 4) - 2x + 2 = 3x^2 - 12x + 12 - 2x + 2 = 3x^2 - 14x + 14$

REF: 081524ai
9 ANS: 1
$(x^2 - 2x + 3)(x+1) = x^3 + x^2 - 2x^2 - 2x + 3x + 3 = x^3 - x^2 + x + 3$

REF: 061609a2
10 ANS: 3
$(2x+3)(4x^2 - 5x + 6) = 8x^3 - 10x^2 + 12x + 12x^2 - 15x + 18 = 8x^3 + 2x^2 - 3x + 18$

REF: 081612ai
11 ANS: 3
$5x^2 - (4x^2 - 12x + 9) = x^2 + 12x - 9$

REF: 011610ai
12 ANS: 2 REF: 011510ai

13 ANS: 1

The area of the original garden is $(x)(2x) = 2x^2$. The area of the new garden is $(x+2)(2x+2)$ $2x^2 + 2x + 4x + 4$ $2x^2 + 6x + 4$.

$2x^2 + 6x + 4 - 2x^2 = 6x + 4$

REF: 010202b

14 ANS:

$P = 2(x^2 + 3x + 2) + 2(4x) = 2x^2 + 6x + 4 + 8x = 2x^2 + 14x + 4$ $A = 4x(x^2 + 3x + 2) = 4x^3 + 12x^2 + 8x$

REF: 061538ia

15 ANS:

$(2x^2 + 7x - 10)(x + 5)$

$2x^3 + 7x^2 - 10x + 10x^2 + 35x - 50$

$2x^3 + 17x^2 + 25x - 50$

REF: 081428ai

16 ANS:

$5x + 4x^2(2x + 7) - 6x^2 - 9x = -4x + 8x^3 + 28x^2 - 6x^2 = 8x^3 + 22x^2 - 4x$

REF: 081731ai

17 ANS: 2

The binomials are conjugates, so use FL.

REF: 011206a2

18 ANS: 1

The binomials are conjugates, so use FL.

REF: 061201a2

19 ANS: 4

$\left(\frac{3}{2}x - 1\right)\left[\left(\frac{3}{2}x + 1\right) - \left(\frac{3}{2}x - 1\right)\right] = \left(\frac{3}{2}x - 1\right)(2) = 3x - 2$

REF: 011524a2

20 ANS:

$(3x^2 - 2x + 5) - (x^2 + 3x - 2) = 2x^2 - 5x + 7$

$\frac{1}{2}x^2(2x^2 - 5x + 7) = x^4 - \frac{5}{2}x^3 + \frac{7}{2}x^2$

REF: 061528ai

21 ANS:

$\frac{4}{9}x^2 - \frac{4}{3}x + 1.\ \left(\frac{2}{3}x - 1\right)^2 = \left(\frac{2}{3}x - 1\right)\left(\frac{2}{3}x - 1\right) = \frac{4}{9}x^2 - \frac{2}{3}x - \frac{2}{3}x + 1 = \frac{4}{9}x^2 - \frac{4}{3}x + 1$

REF: 081034a2

22 ANS:

$6y^3 - \frac{37}{10}y^2 - \frac{1}{5}y.\ \left(\frac{1}{2}y^2 - \frac{1}{3}y\right)\left(12y + \frac{3}{5}\right) = 6y^3 + \frac{3}{10}y^2 - 4y^2 - \frac{1}{5}y = 6y^3 - \frac{37}{10}y^2 - \frac{1}{5}y$

REF: 061128a2