A.APR.A.1: Operations with Polynomials 5

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 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) $x^2 - x + 4$

9 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

10 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.

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

1) $\dfrac{x^2}{8} - \dfrac{1}{9}$

2) $\dfrac{x^2}{16} - \dfrac{1}{9}$

3) $\dfrac{x^2}{8} - \dfrac{x}{6} - \dfrac{1}{9}$

4) $\dfrac{x^2}{16} - \dfrac{x}{6} - \dfrac{1}{9}$

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

1) $\dfrac{4}{25}x^2 - \dfrac{9}{16}y^4$

2) $\dfrac{4}{25}x - \dfrac{9}{16}y^2$

3) $\dfrac{2}{5}x^2 - \dfrac{3}{4}y^4$

4) $\dfrac{4}{5}x$

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

1) 0

2) $-3x$

3) $\dfrac{3}{4}x - 2$

4) $3x - 2$

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

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

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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: 1

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

REF: 061609a2

9 ANS: 1

$(x + 2)(2x + 2)$

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

$2x^2 + 6x + 4$

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

REF: 010202b

10 ANS:

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

REF: 061538ia

11 ANS: 2
The binomials are conjugates, so use FL.

REF: 011206a2

12 ANS: 1
The binomials are conjugates, so use FL.

REF: 061201a2

1

13 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

14 ANS:

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

REF: 081034a2

15 ANS:

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

REF: 061128a2