Algebra 2 CC

ID: 1

Name_____

Unit 2 - Polynomials 3.1-3.2

Date_____ Period_____

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Name each polynomial by degree and number of terms.

1) $4p^2 + 6p$

squared binomial

2) $4b^3 + 2b^2 + 2b$

cubic

3) -6

4) $8n^4 - 6n$

quartic

Simplify each expression.

5) $(-3v + 4v^2 + 2v^3) - (6v^3 + 5v^4 - 2v)$

6) $(3x^2 + 5x^4 - 3x^3) + (6x + 6x^2 - 6x^4)$

7) $(3b^2 + a^4b^3 - 2) - (3 + 6b^2 - 4a^4b^3)$

8) $(7x^3y + y^3 - 6x^4) + (2x^4y^3 - 3x^4 - 2x^3y)$

Factor each.

9) $x^2 + 6x + 5 = 0$

10) $x^2 + 7x + 10 = 0$

11) $5x^2 + 3x - 2 = 0$

12) $3x^2 - 2x - 1 = 0$

Find each product.

13) $(k + 7)(k - 7)$

14) $(3p - 5)(3p + 5)$

15) $(5x + 1)(5x - 1)$

16) $(6n - 7)(6n + 7)$

17) $(2m + 3)(6m - 6)$

18) $(5r + 1)(7r - 3)$

19) $(8x + 5)(2x^2 + 2x - 3)$

20) $(n + 2)(n^2 + 5n - 3)$

Write a polynomial function of least degree with integral coefficients that has the given zeros.

21) $-5, \ 3, \ 2$

22) $3, \ 2, \ 0$

23) $-3, \ -4, \ -2, \ 4$

24) $-1, \ 1, \ 2, \ 0$

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Write a polynomial function of least degree with integral coefficients that has the given zeros.

21) $-5, \ 3, \ 2$

22) $3, \ 2, \ 0$

$x = -5$ $x = 3$ $x = 2$

$(x + 5) = 0$ $(x - 3) = 0$ $(x - 2) = 0$

$x = -5$ $x = 3$ $x = 2$

$(x + 5)(x - 3)(x - 2)$

$x^2 - 3x + 5x - 15$

$(x^2 + 2x - 15)(x - 2)$

$x^3 - 2x^2 + 2x^2 + 4x - 15x + 30$

$x^3 - 19x + 30$

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1

9) $x^2 + 6x + 5 = 0$

ADD   FACTORS
FACTORS
$1+5 = 6$ $1 \cdot 5 = 5$
$-1 + (-5) = -6$ $-1 \cdot -5 = 5$

multiply
5
5 ✕ 1
6
add to

$(x + 5)(x + 1) = 0 \Rightarrow$ solve for x

$x^2 + x + 5x + 5$

$x^2 + 6x + 5$

$(x+5) = 0$ $(x+1) = 0$
$x = -5$ $x = -1$

10) $x^2 + 7x + 10 = 0$

10
2 ✕ 5
7

$11 = 1 \cdot 10$
$7 = 2 \cdot 5$

$(x+2)(x+5) = 0$
$x = -2$ $x = -5$

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11) $5x^2 + 3x - 2 = 0$ $5(-2) = 10$

FACTOR
of -10

ADD
Step:

-10
$+5$ ✕ -2
3

$-2 + 5 = 3$ $-1 \cdot 10$
                $-2 \cdot 5$
Extra $-10 \cdot 1$
Steps: $-5 \cdot 2$

$\left(\dfrac{5x + 5}{5}\right)(5x - 2)$

$(x+1)(5x-2) = 0$

$x+1 = 0$ $5x - 2 = 0$
$x = -1$ $5x = 2/5$

$x = 2/5$

12) $3x^2 - 2x - 1 = 0$

$3(-1) = 3$

-3
-3 ✕ 1
-2

Factors
of -3

$2 = -1 \cdot 3$
$-2 = -3 \cdot 1$

$\left(\dfrac{3x - 3}{3}\right)(3x + 1)$

$(x - 1)(3x + 1) = 0$

$x - 1 = 0$ $3x + 1 = 0$
$x = 1$ $x = -1/3$

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Name each polynomial by degree and number of terms.

1) $4p^2 + 6p$ 2) $4b^3 + 2b^2 + 2b$

squared binomial   *cubic trinomial*

3) -6 4) $8n^4 - 6n$

monomial   *quartic binomial*

Simplify each expression.

5) $(-3v + 4v^2 + 2v^3) - (6v^3 + 5v^4 - 2v)$ 6) $(3x^2 + 5x^4 - 3x^3) + (6x + 6x^2 - 6x^4)$

7) $(3b^2 + a^4b^3 - 2) - (3 + 6b^2 - 4a^4b^3)$ 8) $(7x^3y + y^3 - 6x^4) + (2x^4y^3 - 3x^4 - 2x^3y)$

Factor each.

9) $x^2 + 6x + 5 = 0$ 10) $x^2 + 7x + 10 = 0$

11) $5x^2 + 3x - 2 = 0$ 12) $3x^2 - 2x - 1 = 0$

Find each product.

13) $(k + 7)(k - 7)$ 14) $(3p - 5)(3p + 5)$

15) $(5x + 1)(5x - 1)$ 16) $(6n - 7)(6n + 7)$

17) $(2m + 3)(6m - 6)$ 18) $(5r + 1)(7r - 3)$

19) $(8x + 5)(2x^2 + 2x - 3)$ 20) $(n + 2)(n^2 + 5n - 3)$

Write a polynomial function of least degree with integral coefficients that has the given zeros.

21) $-5, \ 3, \ 2$ 22) $3, \ 2, \ 0$

23) $-3, \ -4, \ -2, \ 4$ 24) $-1, \ 1, \ 2, \ 0$

Factor each.

9) $x^2 + 6x + 5 = 0$

ADD   FACTORS
FACTOR   (5)
(+6)
$1 + 5 = 6$ $1 \cdot 5$ multiply

5
1   5
6
add

$(x + 1)(x + 5) = 0$

$x + 1 = 0$ $x + 5 = 0$
$x = -1$ $x = -5$

Check:
$(x+1)(x+5)$
$x^2 + 5x + x + 5$
$x^2 + 6x + 5$

10) $x^2 + 7x + 10 = 0$

$1 + 10 = 11$ $1 \cdot 10$
$2 + 5 = 7$ $2 \cdot 5$
$5 \cdot 2$

$(x + 2)(x + 5) = 0$
$x = -2$ $x = -5$

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3

Write a polynomial function of least degree with integral coefficients that has the given zeros.

21) −5, 3, 2   22) 3, 2, 0

$x = -5 \quad x = 3 \quad x = 2$

$(x+5)(x-3)(x-2) = 0$

$x+5=0 \quad x-3=0 \quad x-2=0$

$x=-5 \quad\quad x=3 \quad\quad x=2$

$(x+5)(x-3)(x-2) = 0$

$x^2 - 3x + 5x - 15$

$(x^2 + 2x - 15)(x - 2)$

$x^3 - 2x^2 + 2x^2 - 4x - 15x + 30$

$x^3 - 19x + 30$ answer

polynomial

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multiply

11) $5x^2 + 3x - 2 = 0$ $5(-2) = -10$

Adding
to (+3)

Extra: FACTORS
of (−10)

$-1 + 10 = 9$ $-1 \cdot 10$
$-2 + 5 = 3$ $-2 \cdot 5$
                    $-5 \cdot 2$
                    $-10 \cdot 1$

$5(-2)$
-10

-2 ✕ 5
     3

12) $3x^2 - 2x - 1 = 0$ $-1 \cdot 3$
                          $-3 \cdot 1$

-3
$.3$ ✕ 1
$.2$

$\dfrac{(3x - 3)(3x + 1)}{3}$

$(x - 1)(3x + 1)$

Extra:

$\dfrac{(5x - 2)(5x + 5)}{5}$ (GCF)

$(5x - 2)(x + 1)$ answer

what if ...

$5x^2 - 10x + 15$

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

$\dfrac{-b \pm \sqrt{b^2 - 4ac}}{2a}$

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　squared binomial　　　　　　　　　　　*cubic*

3) -6　　　　　　　　　　　　　　　　　4) $8n^4 - 6n$

　　　　　　　　　　　　　　　　　　　　quartic

Simplify each expression.

5) $(-3v + 4v^2 + 2v^3) - (6v^3 + 5v^4 - 2v)$　　　6) $(3x^2 + 5x^4 - 3x^3) + (6x + 6x^2 - 6x^4)$

7) $(3b^2 + a^4b^3 - 2) - (3 + 6b^2 - 4a^4b^3)$　　　8) $(7x^3y + y^3 - 6x^4) + (2x^4y^3 - 3x^4 - 2x^3y)$

Factor each.

9) $x^2 + 6x + 5 = 0$　　　　　　　　　　10) $x^2 + 7x + 10 = 0$

11) $5x^2 + 3x - 2 = 0$　　　　　　　　　12) $3x^2 - 2x - 1 = 0$

Find each product.

13) $(k + 7)(k - 7)$　　　　　　　　　　14) $(3p - 5)(3p + 5)$

15) $(5x + 1)(5x - 1)$　　　　　　　　　16) $(6n - 7)(6n + 7)$

17) $(2m + 3)(6m - 6)$　　　　　　　　　18) $(5r + 1)(7r - 3)$

19) $(8x + 5)(2x^2 + 2x - 3)$　　　　　　20) $(n + 2)(n^2 + 5n - 3)$

Write a polynomial function of least degree with integral coefficients that has the given zeros.

21) $-5,\ 3,\ 2$　　　　　　　　　　　　22) $3,\ 2,\ 0$

23) $-3,\ -4,\ -2,\ 4$　　　　　　　　　24) $-1,\ 1,\ 2,\ 0$

Simplify each expression.

5) $(-3v + 4v^2 + 2v^3) - (6v^3 + 5v^4 - 2v)$　　　6) $(3x^2 + 5x^4 - 3x^3) + (6x + 6x^2 - 6x^4)$

7) $(3b^2 + a^4b^3 - 2) - (3 + 6b^2 - 4a^4b^3)$　　　8) $(7x^3y + y^3 - 6x^4) + (2x^4y^3 - 3x^4 - 2x^3y)$

$$-3 - 6b^2 + 4a^4b^3$$

$$3b^2 - 6b^2 = -3b^2 \qquad\qquad 5a^4b^3 - 3b^2 - 5$$

$$a^4b^3 + 4a^4b^3 = 5a^4b^3$$

$$= -5$$

Aug 7-1:04 PM

Factor each.

9) $x^2 + 6x + 5 = 0$

FACTORS
$1 \cdot 5$

ADD
FACTORS
$1 + 5 = 6$

$(x+1)(x+5) = 0$
$x = -1 \quad x = -5$

multiply
5
1 ✕ 5
6
add

10) $x^2 + 7x + 10 = 0$

ADD   FACTORS
$1 \cdot 10$
$1 + 10 = 11$ $2 \cdot 5 = 10$
$2 + 5 = 7$

$(x+2)(x+5) = 0$ 2 ✕ 5
$x = -2 \quad x = -5$ 10 7

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Write a polynomial function of least degree with integral coefficients that has the given zeros.

21) $-5, 3, 2$

$x = -5 \quad x = 3 \quad x = 2$
$(x+5)(x-3)(x-2)$
$x+5=0 \quad x-3=0 \quad x-2=0$
$x=-5 \quad x=3 \quad x=2$

$(x+5)(x-3)(x-2)$ multiply

$x^2 - 3x + 5x - 15$

$(x^2 + 2x - 15)(x-2)$

$x^3 - 2x^2 + 2x^2 - 4x - 15x + 30$

$x^3 - 19x + 30$ answer

22) $3, 2, 0$

$(x-3)(x-2)(x+0)$

$(x-3)(x-2)(x)$

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6

11) $5x^2 + 3x - 2 = 0$ multiply $5(-2) = -10$

Factors of (-10)

Extra Step: ADD Factors to (3)

$-1 \cdot 10$
$-2 \cdot 5$ $-2+5 = 3$
$-5 \cdot 2$
$-10 \cdot 1$

multiply -10

$-2 \quad\times\quad 5$

3 add

Extra Step:

$(5x - 2)(5x + 5)$ over 5

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

12) $3x^2 - 2x - 1 = 0$

$-3 \quad\times\quad 1$
$.3 \qquad$
-2

$(3x + 1)\dfrac{(3x - 3)}{3}$

$(3x + 1)(x - 1)$

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    quadratic binomial

2) $4b^3 + 2b^2 + 2b$
    cubic trinomial

3) -6
    constant monomial

4) $8n^4 - 6n$
    quartic binomial

Simplify each expression.

5) $(-3v + 4v^2 + 2v^3) - (6v^3 + 5v^4 - 2v)$
    $-5v^4 - 4v^3 + 4v^2 - v$

6) $(3x^2 + 5x^4 - 3x^3) + (6x + 6x^2 - 6x^4)$
    $-x^4 - 3x^3 + 9x^2 + 6x$

7) $(3b^2 + a^4b^3 - 2) - (3 + 6b^2 - 4a^4b^3)$
    $5a^4b^3 - 3b^2 - 5$

8) $(7x^3y + y^3 - 6x^4) + (2x^4y^3 - 3x^4 - 2x^3y)$
    $2x^4y^3 - 9x^4 + 5x^3y + y^3$

Factor each.

9) $x^2 + 6x + 5 = 0$
    $(x + 1)(x + 5) = 0$

10) $x^2 + 7x + 10 = 0$
    $(x + 2)(x + 5) = 0$

11) $5x^2 + 3x - 2 = 0$
    $(5x - 2)(x + 1) = 0$

12) $3x^2 - 2x - 1 = 0$
    $(3x + 1)(x - 1) = 0$

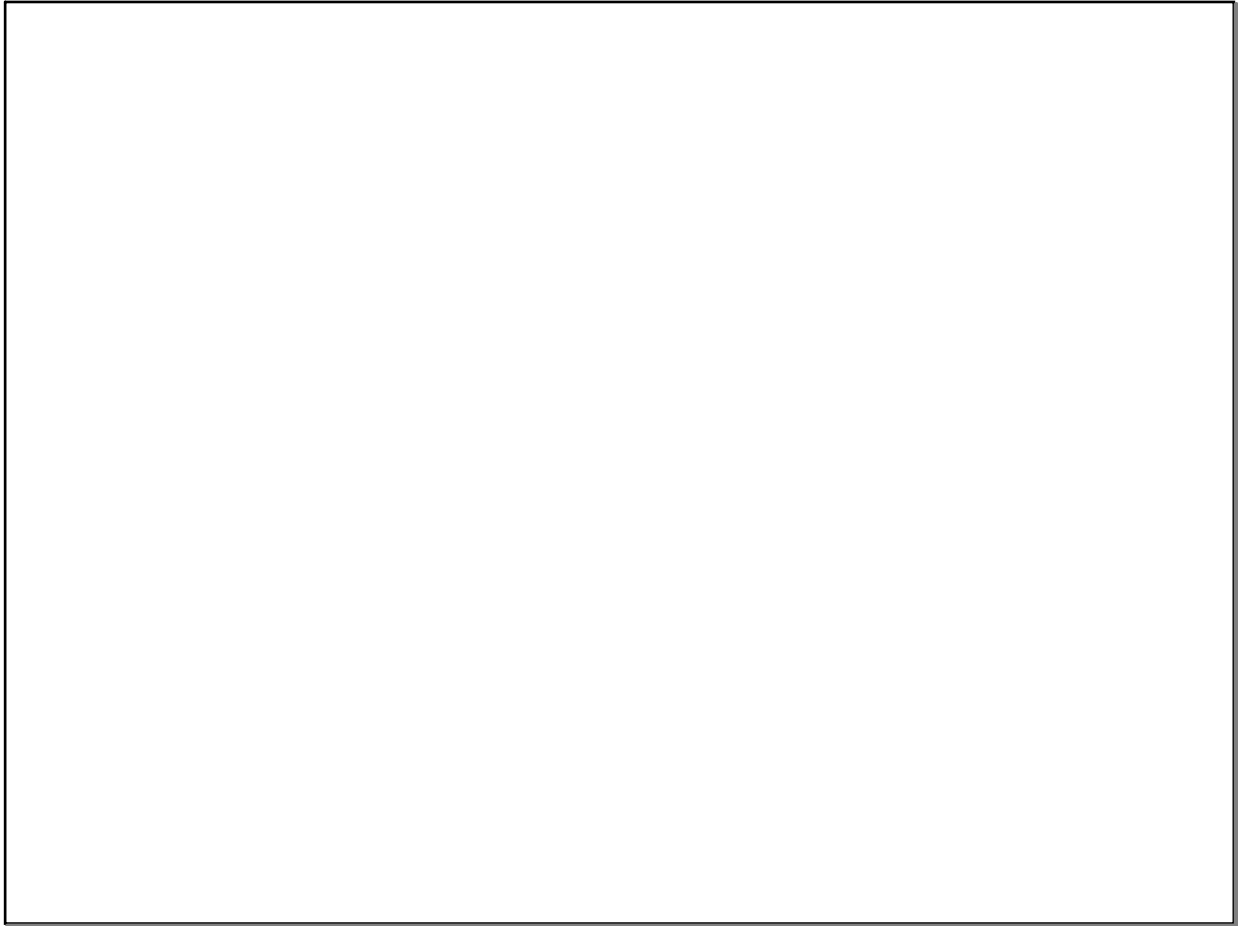**Find each product.**

13) $(k + 7)(k - 7)$
    $k^2 - 49$

14) $(3p - 5)(3p + 5)$
    $9p^2 - 25$

15) $(5x + 1)(5x - 1)$
    $25x^2 - 1$

16) $(6n - 7)(6n + 7)$
    $36n^2 - 49$

17) $(2m + 3)(6m - 6)$
    $12m^2 + 6m - 18$

18) $(5r + 1)(7r - 3)$
    $35r^2 - 8r - 3$

19) $(8x + 5)(2x^2 + 2x - 3)$
    $16x^3 + 26x^2 - 14x - 15$

20) $(n + 2)(n^2 + 5n - 3)$
    $n^3 + 7n^2 + 7n - 6$

Write a polynomial function of least degree with integral coefficients that has the given zeros.

21) $-5, \ 3, \ 2$
    $f(x) = x^3 - 19x + 30$

22) $3, \ 2, \ 0$
    $f(x) = x^3 - 5x^2 + 6x$

23) $-3, \ -4, \ -2, \ 4$
    $f(x) = x^4 + 5x^3 - 10x^2 - 80x - 96$

24) $-1, \ 1, \ 2, \ 0$
    $f(x) = x^4 - 2x^3 - x^2 + 2x$

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