Student: Cole Lamers **Date:** 06/09/19	**Instructor:** Kelly Galarneau **Course:** CA&T Internet (70263) Galarneau	**Assignment:** Basic Concepts of Algebra Part 2

1. Perform the indicated operation. Write the resulting polynomial in standard form.

$(5x^3 + 5x^2 - 5x + 6) + (-5x^3 + 3x - 7)$

$(5x^3 + 5x^2 - 5x + 6) + (-5x^3 + 3x - 7) =$ $5x^2 - 2x - 1$ (Simplify your answer.)

2. Perform the operation indicated.

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

$(x^4 - 8x^2 + 8x) - (2x^3 + x^2 - 2x + 6) =$ $x^4 - 2x^3 - 9x^2 + 10x - 6$
(Simplify your answer.)

3. Perform the indicated operations. Write the resulting polynomial in standard form.

$-2(3x^2 + x + 1) + 5(-2x^2 - 4x - 4)$

The answer is $-16x^2 - 22x - 22$. (Simplify your answer.)

4. Find the product.

$(x + 6)(x^2 + 4x + 4)$

$(x + 6)(x^2 + 4x + 4) =$ $x^3 + 10x^2 + 28x + 24$ (Simplify your answer.)

5. Multiply.

$(r + 8)(r + 9)$

$(r + 8)(r + 9) =$ $r^2 + 17r + 72$
(Simplify your answer.)

6. Perform the indicated operations.

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

$(2x + 3)^2 - 4x^2 =$ $12x + 9$ (Simplify your answer.)

7. Find the product.

$(5 - 2r)(5 + 2r)$

$(5 - 2r)(5 + 2r) =$ $-4r^2 + 25$
(Simplify your answer.)

8. Factor out a factor with a negative coefficient.

$-2s^5 + 12s^4$

$-2s^5 + 12s^4 =$ $-2s^4(s-6)$
(Factor completely.)

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9. Factor the trinomial.

$b^2 - 10b + 21$

Select the correct choice below and, if necessary, fill in the answer box within your choice.

- **A.** The answer is $(b-7)(b-3)$. (Factor completely.)
- **B.** The trinomial is irreducible.

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10. Factor the trinomial.

$a^2 - 2a - 63$

Select the correct choice below and, if necessary, fill in the answer box within your choice.

- **A.** The answer is $(a+7)(a-9)$. (Factor completely.)
- **B.** The trinomial is irreducible.

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11. Factor the trinomial.

$24h^2 - 26h - 5$

Select the correct choice below and, if necessary, fill in the answer box within your choice.

- **A.** $24h^2 - 26h - 5 =$ $(4h-5)(6h+1)$ (Factor completely.)
- **B.** The trinomial is irreducible.

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12. Factor.

$c^2 - 49$

$c^2 - 49 =$ $(c+7)(c-7)$

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13. Factor the following polynomial using the formula for the sum of two cubes.

$y^3 + 729$

$y^3 + 729 =$ $(y+9)\left(y^2 - 9y + 81\right)$ (Factor completely.)

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14. Reduce the rational expression to lowest terms. Identify all numbers that must be excluded from the domain of the given rational expression.

$$\frac{2x+8}{x^2+8x+16}$$

Reduce the rational expression to lowest terms.

$\frac{2x+8}{x^2+8x+16} =$ $\frac{2}{(x+4)}$ (Simplify your answer.)

Identify all numbers that must be excluded from the domain of the rational expression.

$x \neq$ -4

(Use a comma to separate answers as needed.)

15. Reduce the rational expression to lowest terms. Specify the domain of the rational expression by identifying all real numbers that must be excluded from the domain.

$$\frac{6x^2+12x}{x^2+4x+4}$$

The simplified form is $\frac{6x}{x+2}$.

Specify the domain of the rational expression by identifying all real numbers that must be excluded from the domain. Choose the correct answer below.

- The domain of the rational expression is set of all real numbers.
- The domain of the rational expression is set of all real numbers x, $x \neq 2$.
- ✔ The domain of the rational expression is set of all real numbers x, $x \neq -2$.

16. Reduce the rational expression to lowest terms. Identify all numbers that must be excluded from the domain of the given rational expression.

$$\frac{z^2-8z+15}{z^2+5z-24}$$

Reduce the rational expression to lowest terms.

$\frac{z^2-8z+15}{z^2+5z-24} =$ $\frac{z-5}{z+8}$

(Simplify your answer.)

Identify the numbers which must be excluded from the domain.

$z \neq$ $3, -8$

(Use a comma to separate answers as needed.)

17. Add the fractions. Simplify if possible.

$$\frac{x}{25}+\frac{13}{25}$$

$\frac{x}{25}+\frac{13}{25}=$ $\frac{13+x}{25}$ (Simplify your answer.)

18. Find the sum and simplify, if possible.

$$\frac{4}{x-5}+\frac{x+5}{x^2-25}$$

$\frac{4}{x-5}+\frac{x+5}{x^2-25}=$ $\frac{5}{x-5}$

19. Simplify.

$$\frac{\frac{6}{a}}{\frac{7}{a^2}}$$

$\frac{\frac{6}{a}}{\frac{7}{a^2}}=$ $\frac{6a}{7}$

20. Simplify.

$$\frac{\frac{3}{x}}{3-\frac{5}{x}}$$

$\frac{\frac{3}{x}}{3-\frac{5}{x}}=$ $\frac{3}{3x-5}$

21. Simplify.

$\sqrt[3]{1}$

Select the correct choice below and fill in any answer boxes in your choice.

- **A.** The answer is 1. (Simplify your answer.)
- **B.** The root is not a real number.

22. Simplify.

$\sqrt[3]{-1}$

Select the correct choice below and fill in any answer boxes within your choice.

A. $\sqrt[3]{-1} =$ -1
(Type an integer or a decimal.)

B. The root is not a real number.

23. Simplify.

$\sqrt{162}$

$\sqrt{162} =$ $9\sqrt{2}$
(Type an exact answer, using radicals as needed.)

24. Simplify by factoring. Assume that all variables represent nonnegative numbers.

$\sqrt{125t^2}$

The answer is $5t\sqrt{5}$.
(Type an exact answer, using radicals as needed.)

25. Simplify by factoring. Assume that the variable in the radicand represents a positive number.

$\sqrt{45x^3}$

$\sqrt{45x^3} =$ $3x\sqrt{5x}$ (Simplify your answer. Type an exact answer, using radicals as needed.)

26. Simplify.

$\sqrt[3]{-512x^3}$

$\sqrt[3]{-512x^3} =$ $-8x$

27. Add or subtract. Simplify by collecting like radical terms, if possible.

$5\sqrt{3} - 2\sqrt{3} + 4\sqrt{3}$

$5\sqrt{3} - 2\sqrt{3} + 4\sqrt{3} =$ $7\sqrt{3}$
(Simplify your answer. Type an exact answer, using radicals as needed.)

28. Rationalize the denominator in the expression.

$\frac{8}{\sqrt{2}}$

The answer is $4\sqrt{2}$.
(Simplify your answer. Type an exact answer, using radicals as needed. Use integers or fractions for any numbers in the expression.)

29. Rationalize the denominator. Simplify if possible.

$$\frac{15}{2-\sqrt{7}}$$

$\frac{15}{2-\sqrt{7}} =$ $-10-5\sqrt{7}$ (Simplify your answer.)

30. Simplify.

$$25^{\frac{5}{2}}$$

The solution is 3125.
(Simplify your answer. Type an integer or a fraction.)

31. Use rational exponents to simplify.

$$\sqrt[3]{8c^9d^{12}}$$

$\sqrt[3]{8c^9d^{12}} =$ $2c^3d^4$