1. A paddle boat can move at a speed of 16 km/h in still water. The boat is paddled 14 km downstream in a river in the same time it takes to go 7 km upstream. What is the speed of the river?

The speed of the river is ☐ km/h .

(Simplify your answer. Type an integer or a fraction.)

2. Solve the equation and check the proposed solution.

$$\frac{2x}{x+3} - 2 = \frac{x-19}{x-3}$$

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

○ A. $x =$ ☐
    (Simplify your answer. Use a comma to separate answers as needed.)
○ B. There is no solution.

3. Perform the indicated operation.

$$\frac{3}{x-9} + 3$$

$$\frac{3}{x-9} + 3 = \boxed{}$$

4. Eight divided by the difference of a number and 1 minus 7 divided by a number plus 1, equals 6 times the reciprocal of the difference of the number squared and 1. What is the number?

The number is ☐ .

5. Solve the equation and check the proposed solution.

$$5 + \frac{8}{a-2} = \frac{4a}{a-2}$$

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

○ A. $a =$ ☐
    (Simplify your answer. Use a comma to separate answers as needed.)
○ B. There is no solution.

6. Find the product and simplify if possible.

$$\frac{t^2 + 5t + 6}{t^2 + 6t - 40} \cdot \frac{t^2 + 5t - 36}{t^2 + 4t + 4}$$

$$\frac{t^2 + 5t + 6}{t^2 + 6t - 40} \cdot \frac{t^2 + 5t - 36}{t^2 + 4t + 4} = \boxed{}$$

(Simplify your answer.)

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7. Solve the equation.

$$\frac{x + 1}{x + 4} = \frac{x^2 - 18x}{x^2 + 2x - 8} - \frac{x - 4}{x - 2}$$

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

○A. $x = \boxed{}$

   (Type an integer or a simplified fraction. Use a comma to separate answers as needed.)

○B. There is no solution.

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8. Subtract the rational expressions.

$$\frac{8x - 8}{x^2 - 4x - 21} - \frac{7x - 1}{x^2 - 4x - 21}$$

$$\frac{8x - 8}{x^2 - 4x - 21} - \frac{7x - 1}{x^2 - 4x - 21} = \boxed{}$$ (Simplify your answer.)

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9. Find the quotient and simplify.

$$\frac{m^2 - n^2}{m + n} \div \frac{m}{m^2 + nm}$$

$$\frac{m^2 - n^2}{m + n} \div \frac{m}{m^2 + nm} = \boxed{}$$ (Simplify your answer.)

10. Perform the indicated operation.

$$\frac{x+8}{x^2+x-42} + \frac{x+9}{x^2+2x-35}$$

$$\frac{x+8}{x^2+x-42} + \frac{x+9}{x^2+2x-35} = \boxed{}$$

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11. Divide.

$$\frac{a^2+ar+qa+qr}{a-q} \div \frac{a+r}{a+q}$$

$$\frac{a^2+ar+qa+qr}{a-q} \div \frac{a+r}{a+q} = \boxed{} \quad \text{(Simplify your answer.)}$$

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12. Simplify.

$$\frac{4a^{-1} + (4a)^{-1}}{a^{-1} + 4a^{-2}}$$

$$\frac{4a^{-1} + (4a)^{-1}}{a^{-1} + 4a^{-2}} = \boxed{}$$

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13. A driver took a day-trip driving at two different speeds. He drove 50 miles at a slower speed and 260 miles at a speed 40 miles per hour faster. If the time spent during the faster speed was twice that spent at a slower speed, find the two speeds during the trip.

The driver's speed during the first portion was $\boxed{}$ miles per hour and his speed during the second portion was $\boxed{}$ miles per hour.

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14. Find the product and simplify if possible.

$$\frac{z^2+4z+3}{z^2+8z-9} \cdot \frac{z^2+7z-8}{z^2+2z+1}$$

$$\frac{z^2+4z+3}{z^2+8z-9} \cdot \frac{z^2+7z-8}{z^2+2z+1} = \boxed{}$$
(Simplify your answer.)

15.

Simplify the expression.

$$\frac{x^2 + 4x - 5}{x - 1}$$

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

A. $\dfrac{x^2 + 4x - 5}{x - 1} = \boxed{}$ (Simplify your answer.)

B. The expression cannot be simplified.

16.

Find the domain of the rational function.

$$R(x) = \frac{-1 + 4x}{x^3 - 8x^2 + 7x}$$

The domain is $\{x \mid x$ is a real number and $x \neq \boxed{}\}$.
(Simplify your answer. Type an integer or a fraction. Use a comma to separate answers as needed.)

17.

Find each function value. If $g(x) = \dfrac{x^2 + 8}{x^3 - 25x}$, find g(3), g(− 2), and g(2).

$g(3) = \boxed{}$
(Type an integer or a simplified fraction.)

$g(-2) = \boxed{}$
(Type an integer or a simplified fraction.)

$g(2) = \boxed{}$
(Type an integer or a simplified fraction.)

18.

Solve the equation.

$$\frac{x}{4} + \frac{17x}{8} = \frac{x}{20}$$

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

A. $x = \boxed{}$ (Use a comma to separate answers as needed.)

B. There is no solution.

19. Simplify the complex fraction.

$$\dfrac{\dfrac{x-1}{x^2-4}}{1+\dfrac{1}{x-2}}$$

$$\dfrac{\dfrac{x-1}{x^2-4}}{1+\dfrac{1}{x-2}} = \boxed{}$$

20. Simplify the complex fraction.

$$\dfrac{\dfrac{4x^2-y^2}{xy}}{\dfrac{2}{y}-\dfrac{1}{x}}$$

$$\dfrac{\dfrac{4x^2-y^2}{xy}}{\dfrac{2}{y}-\dfrac{1}{x}} = \boxed{}$$

21. Solve the equation and check the proposed solution.

$$8 + \dfrac{42}{a-6} = \dfrac{7a}{a-6}$$

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

○ A. $a = \boxed{}$
    (Simplify your answer. Use a comma to separate answers as needed.)

○ B. There is no solution.

22. Multiply. Simplify if possible.

$$\dfrac{10x}{2} \cdot \dfrac{x^4}{5x^2}$$

$$\dfrac{10x}{2} \cdot \dfrac{x^4}{5x^2} = \boxed{}$$

23. Perform the indicated operation.

$$\frac{x}{x^2 - 1} - \frac{3}{x^2 - 2x + 1}$$

$$\frac{x}{x^2 - 1} - \frac{3}{x^2 - 2x + 1} = \boxed{}$$

24. Find the domain of the rational function.

$$f(x) = \frac{4x}{2x - 4}$$

The domain is $\{x \mid x$ is a real number and $x \neq \boxed{} \}$.
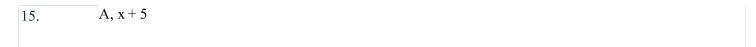(Simplify your answer. Type an integer or a fraction. Use a comma to separate answers as needed.)

25. Perform the indicated operation.

$$\frac{4}{2y} + \frac{49}{7y}$$

$$\frac{4}{2y} + \frac{49}{7y} = \boxed{}$$ (Simplify your answer.)

1.	$\dfrac{16}{3}$
2.	$A,\ 15,\ -5$
3.	$\dfrac{3x - 24}{x - 9}$
4.	-9
5.	B
6.	$\dfrac{(t+3)(t+9)}{(t+10)(t+2)}$
7.	$A,\ -18, 1$
8.	$\dfrac{1}{x+3}$
9.	$m^2 - n^2$
10.	$\dfrac{2x^2 + 6x - 94}{(x+7)(x-6)(x-5)}$
11.	$\dfrac{(a+q)^2}{a-q}$
12.	$\dfrac{17a}{4a+16}$
13.	$\dfrac{25}{65}$
14.	$\dfrac{(z+3)(z+8)}{(z+9)(z+1)}$

| 15. | A, $x + 5$ |

| 16. | 0,7,1 |

17.	$-\dfrac{17}{48}$
	$\dfrac{2}{7}$
	$-\dfrac{2}{7}$

| 18. | A, 0 |

| 19. | $\dfrac{1}{x + 2}$ |

| 20. | $2x + y$ |

| 21. | B |

| 22. | x^3 |

| 23. | $\dfrac{x^2 - 4x - 3}{(x - 1)^2(x + 1)}$ |

| 24. | 2 |

| 25. | $\dfrac{9}{y}$ |