1. Solve using the principles together. Check your answer.

$8y - 7 = 23 - 2y$

The solution is $y =$ ☐.
(Type an integer or a simplified fraction.)

2. Solve using the principles together. Don't forget to check.

$7(5x + 9) = 18 - (x + 9)$

The solution is $x =$ ☐.
(Simplify your answer.)

3. Solve.

$20v^2 + v = 12$

The solution(s) is/are $v =$ ☐.
(Simplify your answer. Use a comma to separate answers as needed.)

4. Solve.

$40 = t(t - 6)$

$t =$ ☐
(Simplify your answer. Use a comma to separate answers as needed.)

5. Solve the following equation.

$3x^2 - 15 = 0$

The solution(s) is/are ☐.
(Type exact answers, using radicals as needed.
Use a comma to separate answers as needed.
Type each solution only once.)

6. Solve $S = \frac{9}{4}N + 36$ for N.

Choose the correct answer below.

○A. $N = \frac{9}{4}S - 36$

○B. $N = \frac{4}{9}(S - 36)$

○C. $N = \frac{4}{9}S - 36$

○D. $N = \frac{9}{4}(S - 36)$

7. Find the domain of the rational expression.

$$\frac{2x-18}{x(x-9)}$$

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

- ○A. The domain is $\{x \mid x \text{ is a real number } \textit{and } x \neq \blacksquare\}$.
  (Use a comma to separate answers as needed.)
- ○B. There are no numbers excluded from the domain.

8. Find the domain of the rational expression.

$$\frac{2x^2-20x+50}{(x^2-25)(x^2-2x-15)}$$

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

- ○A. The domain is $\{x \mid x \text{ is a real number and } x \neq \blacksquare\}$.
  (Use a comma to separate answers as needed.)
- ○B. There are no numbers excluded from the domain.

9. Simplify by removing factors of 1. $\dfrac{q^2-49}{q^2-14q+49}$

The simplified form is $\square$.

10. Multiply and simplify.

$$\frac{y^2-4y-12}{5y^3-4y^2} \cdot \frac{25y^3-16y}{6y-36}$$

The simplified product is $\square$.

11. Divide and simplify, if possible.

$$\frac{2x+4}{5x-10} \div \frac{(x+2)^2}{(x-2)^2}$$

$\dfrac{2x+4}{5x-10} \div \dfrac{(x+2)^2}{(x-2)^2} = \square$ (Type your answer in factored form.)

12. Perform the indicated operation. Simplify, if possible.

$$\frac{6}{x^2-9}-\frac{6}{x+3}$$

The difference is $\square$.
(Simplify your answer.)

13. Subtract and simplify.

$$\frac{w}{w^2-2w-3}-\frac{8}{w+1}$$

$$\frac{w}{w^2-2w-3}-\frac{8}{w+1}=\square$$

14. Add. Simplify by removing a factor of 1 when possible.

$$\frac{7v+2}{4v^2-8v-60}+\frac{9}{4v^2-24v+20}$$

The sum is $\square$.
(Type your answer in factored form if factorable.)

15. Simplify.

$$\frac{\frac{x}{y}-\frac{y}{x}}{\frac{1}{y}+\frac{1}{x}}$$

$$\frac{\frac{x}{y}-\frac{y}{x}}{\frac{1}{y}+\frac{1}{x}}=\square$$

16. Simplify.

$$\sqrt{(-7)^2}$$

$\sqrt{(-7)^2}=\square$

17. Simplify.

$\sqrt[3]{-64x^3}$

$\sqrt[3]{-64x^3} = \square$

18. Simplify. Assume that no radicands were formed by raising negative quantities to even powers.

$\sqrt{5x^9y}\sqrt{15xy}$

$\sqrt{5x^9y}\sqrt{15xy} = \square$
(Simplify your answer.)

19. Add or subtract. Simplify by collecting like radical terms if possible.
$5\sqrt{27} - \sqrt{108} + 2\sqrt{48}$

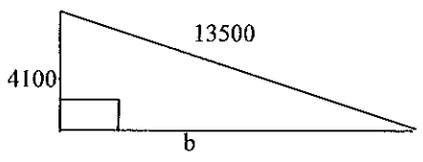
$5\sqrt{27} - \sqrt{108} + 2\sqrt{48} = \square$
(Simplify your answer. Type an exact answer, using radicals as needed.)

20. Simplify. Assume that no radicands were formed by raising negative quantities to even powers.

$(\sqrt{2} - \sqrt{3})^2$

$(\sqrt{2} - \sqrt{3})^2 = \square$
(Simplify your answer. Type an exact answer, using radicals as needed.)

21. An airplane flying at an altitude of 4100 ft, has a slanted distance directly to the airport of 13500 ft. How far is the airplane horizontally from the airport?



The horizontal distance to the airport is approximately $\square$ ft.
(Round to the nearest tenth as needed.)

22. Rationalize the denominator.

$\sqrt{\frac{10}{7}}$

$\sqrt{\frac{10}{7}} = \square$
(Simplify your answer. Type an exact answer, using radicals as needed.)

23. Simplify.

$125^{-1/3}$

Which term represents the simplified form of $125^{-1/3}$?

○A. $\frac{1}{5}$

○B. $\frac{1}{\sqrt[3]{125}}$

○C. -5

○D. $\sqrt[3]{125^{-1}}$

24. Simplify and write in radical notation.

$(5a^{3/5})(2a^{6/5})$

Choose the correct simplified form of $(5a^{3/5})(2a^{6/5})$ written in radical notation.

○A. $10a\sqrt[5]{a^4}$

○B. $10a^{9/5}$

○C. $10a^{5/9}$

○D. $10\sqrt[9]{a^5}$

25. Simplify and then write radical notation.

$$\frac{x^{5/7}y^{13/14}}{x^{-2/7}y^{1/2}}$$

$$\frac{x^{5/7}y^{13/14}}{x^{-2/7}y^{1/2}} = \square$$