

Note: Many other questions are possible. Study all previous tests and quizzes, plus groupwork & homework.

1. Decide if **rational or irrational**. If **rational**, write as a **simplified fraction**.
If **irrational**, find a calculator **approximation** to at least 5 decimal places.

(a) $\sqrt{0.0361}$ _____

(b) $\sqrt{0.361}$ _____

2. **Solve** the following **system** of equations. **Check** any solution that you find.

$$\begin{aligned}14x + 15y &= -5 \\10x + 21y &= 17\end{aligned}$$

3. **Solve** $3(4y - 9) + 8 = 5(3y - 5) - 24$ and **check** your answer.
4. **Solve the inequality**, $-1 < 2x - 5 \leq 9$, and **graph** on the real number line.
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5. **Factor** completely $10x^4 + 25x^3 - 165x^2$

6. **Simplify** and write with only **positive** exponents. $\frac{(a^4 b^{-6})^{-4}}{(a^{-3} b^7)^3} =$

7. **Long division**.

$$x - 8 \overline{) 2x^3 - 15x^2 - 4x - 12}$$

8. **Add** $\frac{x+3}{x^2-4x-77} + \frac{x-3}{x^2-13x+22} =$

9. **Multiply** $\frac{x^2-8x+16}{x^2-4x-77} \cdot \frac{x^2-121}{x^2-16}$

10. **Solve** $12x^2 = 11x + 15$

11. **Solve** $9x^2 - 30x + 22 = 0$ using the **quadratic formula**.

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12. **Rationalize the denominator** $\frac{5 - 3\sqrt{7}}{3 + \sqrt{7}} =$

13. (a) Find the **slope-intercept equation** of the line through the point (4, 3)
with slope, $m = \frac{7}{4}$

(b) On graph paper, draw a large, accurate **graph** of the line in part (a).

14. Given the line with equation $-7x + 6y = 21$, find

(a) find the **x-intercept**

(b) find the **y-intercept**

(c) find the **slope** of the line

In the word problems, set up an appropriate equation to solve the problem.

Remember to check, and answer with a sentence.

15. The **perimeter** of a rectangle is 78 meters.

The length is five times the width. Find the dimensions of the rectangle.

16. The **area** of a rectangle is 78 square meters.

The length is one meter more than twice the width.

Find the dimensions of the rectangle.

17. Al starts walking north at noon, at 3 miles per hour. Sal leaves the same spot one hour later, running after Al at 5 miles per hour.

What time is it when Sal catches up with Al, and how far have they gone?

18. Fred's motorboat can travel at 5 miles per hour in still water. He motors

downstream for 13 miles, then cuts the motor and drifts at the speed of the

current for 3 miles. The total time is 4 hours. Find the speed of the current.