

MATH 130

Quiz 2 review

x^2

Equations, formulas, mixtures, and quadratic methods

Monday, September 7, 2026
3:15–4:05 PM

Quiz 2: Wednesday, September 9 at 2:10 PM

ALEKS completion before Quiz 2

PLAN

Complete both modules

CURRENT MODULE

Sections 1.1, 1.2, 1.4

Finish every assigned topic. Give priority to percent mixtures, fractional equations, literal formulas, and quadratic roots.

REVIEW MODULE

Review R.6

Finish the remaining rational-expression topics. Focus on division, factoring and cancellation, LCDs, and complex fractions.

Class snapshot from Sept 7: current module 48% complete; R.6 69% complete. These percentages measure learning progress, not grades.

Quiz 2 scope

PLAN

DIRECTLY ASSESSED

- 14 pts** Fractional linear equation
- 14 pts** Literal formula rearrangement
- 16 pts** Percent mixture model
- 16 pts** Quadratic solved by factoring
- 20 pts** Quadratic solved by completing the square
- 20 pts** Quadratic formula with discriminant

NOT A DIRECT QUIZ QUESTION

- Standalone R.6 simplification
- Restrictions and complex fractions
- Zero, one, or infinitely many solutions
- Rational equations with variable denominators

6 questions • 100 points • 25 minutes • supporting work required

The method named in the prompt

PLAN

Clear the fractions

— Find the LCD, then multiply every term

Solve the formula for ...

— Undo operations and isolate the named letter

Mix two concentrations

— Amount $\times$ concentration gives pure amount

Solve by factoring

— Factor completely, then use the zero-product property

Complete the square

— Add the square of half the x-coefficient

Use the quadratic formula

— Record a, b, c and the discriminant first

Fractional linear equations

MODEL

WORKED EXAMPLE

$$\frac{2x - 5}{6} + \frac{x + 1}{4} = \frac{3}{2}$$

- 1 LCD = 12** Multiply every term by 12.
- 2 Distribute** $2(2x - 5) + 3(x + 1) = 18$
- 3 Combine** $4x - 10 + 3x + 3 = 18$, so $7x = 25$.
- 4 Solve and check** $x = \frac{25}{7}$. Substitute into the original equation.

Keep every numerator grouped until the LCD has distributed.

Fraction practice

PRACTICE

Work for 90 seconds. Show the LCD step.

$$\frac{x + 4}{3} - \frac{x - 2}{6} = \frac{5}{2}$$

Your work must show: LCD, distribution, solution

Next slide: answer and check

Fraction check

CHECK

ANSWER AND DECISIVE STEPS

$$\frac{x + 4}{3} - \frac{x - 2}{6} = \frac{5}{2}$$

6 × equation: $2(x + 4) - (x - 2) = 15$

$2x + 8 - x + 2 = 15$

$x + 10 = 15$

$x = 5$

Literal formula equations

MODEL

$$V = \frac{1}{3} Bh \quad \text{solve for } h$$

$$3V = Bh$$

$$h = \frac{3V}{B}$$

$$B \neq 0$$

TRY

$$d = \frac{(v + u)t}{2} \quad \text{solve for } u$$

Write one legal operation per line.

Keep $v + u$ grouped while clearing the 2 and t .

The requested letter may begin inside a numerator or a grouped expression.

Literal formula check

CHECK

ANSWER AND DECISIVE STEPS

$$d = \frac{(v + u)t}{2}$$

$$2d = (v + u)t$$

$$\frac{2d}{t} = v + u$$

$$u = \frac{2d}{t} - v$$

Restriction from division: $t \neq 0$

Percent mixture models

MODEL

How much 25% solution and 55% solution makes 20 L of 40% solution?

- 1 **Define** x = liters of 25% solution; $20 - x$ = liters of 55% solution.
- 2 **Model pure amount** $0.25x + 0.55(20 - x) = 0.40(20)$
- 3 **Solve** $0.25x + 11 - 0.55x = 8$, so $-0.30x = -3$ and $x = 10$.
- 4 **State both quantities** 10 L of 25% solution and 10 L of 55% solution.

Check: $0.25(10) + 0.55(10) = 8$ liters of pure solution, which equals $0.40(20)$.

Mixture practice

PRACTICE

Work for 2 minutes. Define one variable and state both amounts.

A lab technician mixes a 10% solution with a 40% solution to make 18 liters of a 30% solution.

Variable definition

Pure-amount equation

Two final quantities with units

Mixture check

CHECK

ANSWER AND DECISIVE STEPS

Let x = liters of 10% solution. Then $18 - x$ = liters of 40% solution.

$$0.10x + 0.40(18 - x) = 0.30(18)$$

$$0.10x + 7.2 - 0.40x = 5.4$$

$$-0.30x = -1.8, \text{ so } x = 6$$

Answer: 6 L of 10% solution and 12 L of 40% solution

Quadratic equations by factoring

MODEL +
PRACTICE

MODEL

$$6x^2 + x - 2 = 0$$

$$6x^2 + 4x - 3x - 2 = 0$$

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

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

$$x = \frac{1}{2} \text{ or } x = \frac{-2}{3}$$

TRY

$$2x^2 - 7x + 3 = 0$$

Product $ac = 6$

Sum $b = -7$

Split the middle term, group, then set each factor equal to zero.

The equation must equal zero before using the zero-product property.

Factoring check

CHECK

ANSWER AND DECISIVE STEPS

$$2x^2 - 7x + 3 = 0$$

$$2x^2 - 6x - x + 3 = 0$$

$$2x(x - 3) - 1(x - 3) = 0$$

$$(2x - 1)(x - 3) = 0$$

$$x = \frac{1}{2} \text{ or } x = 3$$

Completing the square

MODEL

WORKED EXAMPLE

$$x^2 + 4x - 1 = 0$$

- 1 Move the constant $x^2 + 4x = 1$
- 2 Half b, then square $(4 \div 2)^2 = 4$. Add 4 to both sides.
- 3 Factor the perfect square $x^2 + 4x + 4 = 5$, so $(x + 2)^2 = 5$.
- 4 Use both square roots $x + 2 = \pm\sqrt{5}$, so $x = -2 \pm \sqrt{5}$.

If the coefficient of x^2 is not 1, divide every term by that coefficient first.

Completing-square practice

PRACTICE

Work for 2 minutes. Show the number added to both sides.

$$x^2 - 6x + 1 = 0$$

Checkpoint: half of -6 is _____, and its square is _____.

Give exact solutions.

Completing-square check

CHECK

ANSWER AND DECISIVE STEPS

$$x^2 - 6x = -1$$

$$x^2 - 6x + 9 = 8$$

$$(x - 3)^2 = 8$$

$$x - 3 = \pm\sqrt{8} = \pm 2\sqrt{2}$$

$$x = 3 \pm 2\sqrt{2}$$

The quadratic formula

MODEL

$$x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$$

Solve $2x^2 + 3x - 4 = 0$

$a = 2$ $b = 3$ $c = -4$

$$D = b^2 - 4ac = 3^2 - 4(2)(-4) = 41$$

$$x = \frac{-3 \pm \sqrt{41}}{2(2)} = \frac{-3 \pm \sqrt{41}}{4} \quad \text{Exact form}$$

Record a , b , c and D before substitution. Keep the sign of c .

Quadratic-formula practice

PRACTICE

Work for 2 minutes. Record a, b, c and D.

$$3x^2 + 2x - 2 = 0$$

$$a = \underline{\hspace{2cm}} \quad b = \underline{\hspace{2cm}} \quad c = \underline{\hspace{2cm}}$$

$$D = b^2 - 4ac = \underline{\hspace{2cm}}$$

Give exact simplified solutions.

Quadratic-formula check

CHECK

ANSWER AND DECISIVE STEPS

$$a = 3, \quad b = 2, \quad c = -2$$

$$D = 2^2 - 4(3)(-2) = 28$$

$$x = \frac{-2 \pm \sqrt{28}}{6}$$

$$x = \frac{\sqrt{1} \pm \sqrt{7}}{3}$$

Mixed readiness check

PRACTICE

Choose any two. Show the method named in each prompt.

1 Clear fractions

$$\frac{x-1}{2} + \frac{x+3}{4} = 3$$

2 Solve for C

$$F = \frac{9}{5} C + 32$$

3 Mix 15% and 45% to make
12 L of 35% solution

4 Factor:

$$4x^2 - 4x - 3 = 0$$

5 Complete the square:

$$x^2 + 2x - 7 = 0$$

6 Use the quadratic formula:

$$x^2 - 4x - 1 = 0$$

Mixed readiness key

CHECK

ANSWER AND DECISIVE STEPS

1

$$x = \frac{11}{3}$$

LCD 4: $2(x - 1) + (x + 3) = 12$

2

$$C = \frac{5(F - 32)}{9}$$

Subtract 32, then multiply by 5/9

3

4 L at 15%; 8 L at 45%

$$0.15x + 0.45(12 - x) = 0.35(12)$$

4

$$x = \frac{3}{2} \quad \text{or} \quad \frac{-1}{2}$$

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

5

$$x = -1 \pm 2\sqrt{2}$$

$$(x + 1)^2 = 8$$

6

$$x = 2 - \sqrt{5} \text{ or } 2 + \sqrt{5}$$

$$D = 20$$

Your next ALEKS target

CLOSE

Before Wednesday's quiz

- 1** **Finish Sections 1.1, 1.2, 1.4** Start with mixtures and quadratic methods.
- 2** **Finish Review R.6** Prioritize division, LCDs, and complex fractions.
- 3** **Practice written solutions** The quiz gives no credit for an unsupported answer.
- 4** **Plan for 25 minutes** About four minutes per question, with a final check.

Write one specific ALEKS topic you will complete next.