

Coordinate geometry

Distance, midpoint, slope, lines, and circles

2.1

2.2 2.4

CURRENT ALEKS MODULE

Friday, September 11, 2026

3:15–4:05 PM

Course site: [Unit 1C lesson, practice, checkpoint](#)

Friday’s 50 minutes

PLAN

Course website, then Sections 2.1, 2.2, and 2.4

3 min 3:15–3:18	5 min 3:18–3:23	18 min 3:23–3:41	17 min 3:41–3:58	4 min 3:58–4:02
Course site	Retrieval	Distance + midpoint	Slope + lines	Circles

3 minutes

4:02–4:05

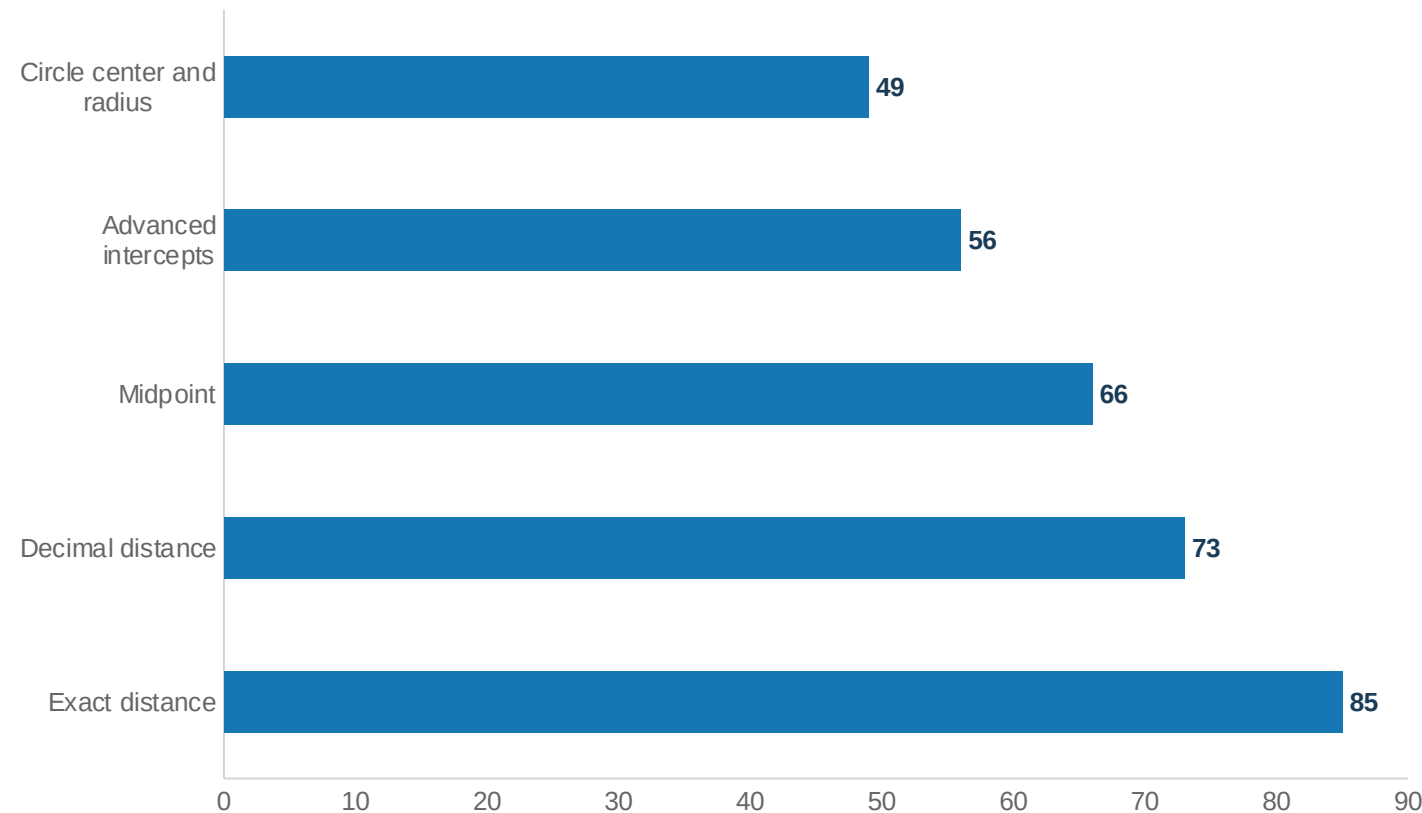
Exit ticket and ALEKS plan

Every practice problem includes a check before the next topic.

Course website and current priorities

THIS WEEK

The updated dashboard keeps this week's Unit 1C work together



36%

average current-module progress

This week on the site

Courses / MATH 130
Plan and Learn: Unit 1C
Practice: current skills
Progress: Quiz 3 checkpoint

Entrance retrieval

PRACTICE

Work without notes for 4 minutes.

- 1 Name the quadrant containing the point $(-4, 3)$.
- 2 From $A(-2, 1)$ to $B(4, 5)$, find Δx and Δy .
- 3 Does $(4, 5)$ satisfy $y = 2x - 3$? Show the substitution.

Keep the coordinate order consistent: x first, y second.

Entrance check

CHECK

Explain the reason for each answer.

1 Quadrant II because x is negative and y is positive.

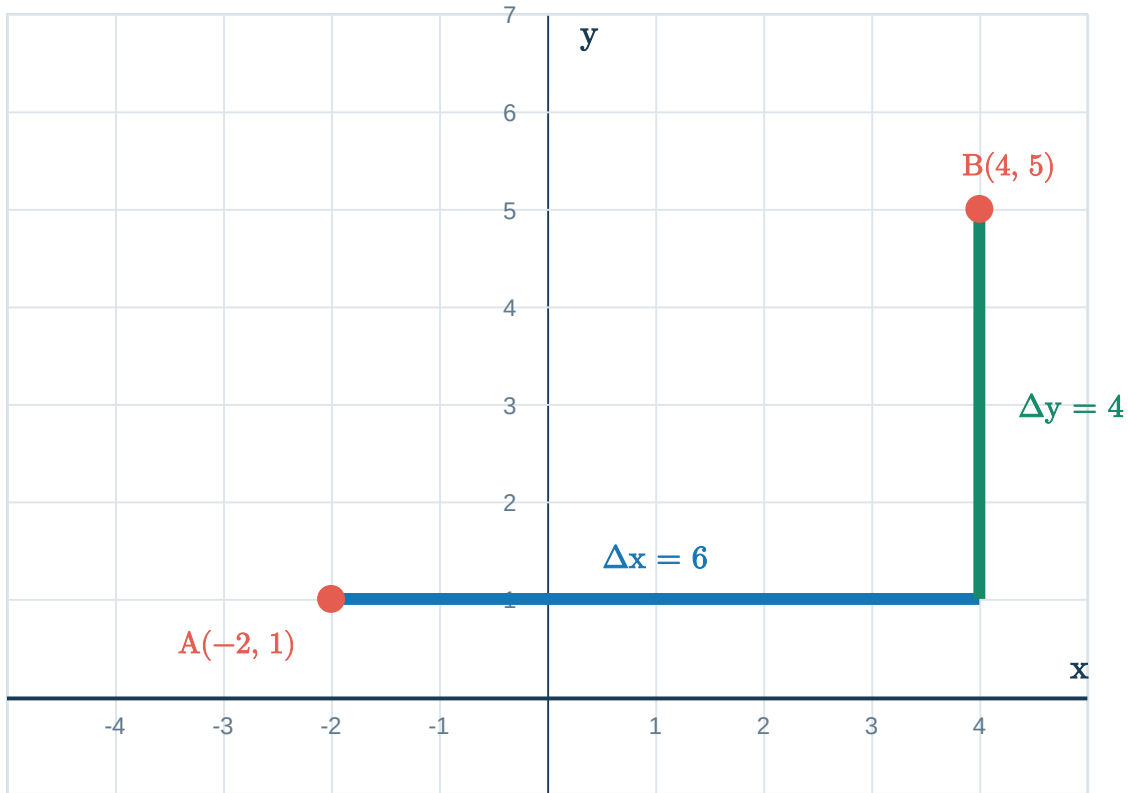
2 $\Delta x = 4 - (-2) = 6$ and $\Delta y = 5 - 1 = 4$.

3 Yes. Substitution gives $5 = 2(4) - 3 = 5$.

The same Δx and Δy will produce distance and slope.

Coordinate changes

A(-2, 1) and B(4, 5)



Horizontal change

$$\Delta x = x_2 - x_1 = 4 - (-2) = 6$$

Vertical change

$$\Delta y = y_2 - y_1 = 5 - 1 = 4$$

Keep the endpoint order the same in both differences.

Distance and midpoint

EXPLAIN

Both formulas begin with the same two endpoints.

DISTANCE

$$d = \sqrt{(x_2 - x_1)^2 + (y_2 - y_1)^2}$$

Square the coordinate changes, add, then take the square root.

MIDPOINT

$$M = (\frac{1}{2}(x_1 + x_2), \frac{1}{2}(y_1 + y_2))$$

Average the x-coordinates and y-coordinates separately.

Distance measures length. Midpoint locates the halfway point.

Worked example

A(-2, 1) and B(4, 5)

$$\Delta x = 6 \quad \Delta y = 4$$

Distance

$$d = \sqrt{6^2 + 4^2}$$

$$d = \sqrt{52} = 2\sqrt{13}$$

$$d \approx 7.2$$

Midpoint

$$M = \left(\frac{1}{2}(-2 + 4), \frac{1}{2}(1 + 5)\right)$$

$$M = \left(\frac{1}{2} \cdot 2, \frac{1}{2} \cdot 6\right)$$

$$M = (1, 3)$$

Keep the exact radical unless the prompt requests a decimal.

Distance and midpoint practice

PRACTICE

Work independently for 4 minutes.

$$C(-3, -2) \text{ and } D(5, 4)$$

- 1 Find Δx and Δy .
- 2 Find the exact distance and its decimal value.
- 3 Find the midpoint.

Reasonableness check: the distance is positive and the midpoint lies between the endpoints.

Practice check

CHECK

C(-3, -2) and D(5, 4)

$$\Delta x = 8 \quad \Delta y = 6$$

Distance

$$\begin{aligned} d &= \sqrt{8^2 + 6^2} \\ &= \sqrt{100} = 10 \\ \text{Decimal value: } 10.0 \end{aligned}$$

Midpoint

$$\begin{aligned} M &= (\tfrac{1}{2}(-3 + 5), \tfrac{1}{2}(-2 + 4)) \\ &= (\tfrac{1}{2} \cdot 2, \tfrac{1}{2} \cdot 2) \\ &= (1, 1) \end{aligned}$$

Both answers satisfy the reasonableness checks.

Slope from two points

EXPLAIN

A(-2, 1) and B(4, 5)

$$m = \Delta y / \Delta x = (y_2 - y_1) / (x_2 - x_1)$$

Use the same endpoint order in the numerator and denominator.

$$\begin{aligned} m &= (5 - 1) / (4 - (-2)) \\ m &= 4 / 6 = \frac{2}{3} \end{aligned}$$

Positive slope means the line rises from left to right.

Horizontal and vertical lines

EXPLAIN

The denominator determines whether the slope exists.

Horizontal line

$$P(-3, 2), Q(5, 2)$$

$$\Delta y = 0$$
$$m = 0 / 8 = 0$$

Equation form: $y = 2$

Vertical line

$$R(4, -2), S(4, 6)$$

$$\Delta x = 0$$
$$m = 8 / 0 \text{ is undefined}$$

Equation form: $x = 4$

A zero numerator gives slope 0. A zero denominator gives undefined slope.

Equation through two points

P(-1, 2) and Q(3, 10)

1 Slope: $m = (10 - 2) / (3 - (-1)) = 8 / 4 = 2$

2 Point-slope form: $y - 2 = 2(x + 1)$

3 Slope-intercept form: $y = 2x + 4$

Check both points

$$2 = 2(-1) + 4 \qquad 10 = 2(3) + 4$$

Each endpoint must satisfy the final equation.

Line practice

PRACTICE

Work for 4 minutes. Use $R(-2, 5)$ and $S(4, -1)$.

- 1 Find the slope.
- 2 Write the equation in slope-intercept form.
- 3 Find the x-intercept and y-intercept.

Intercept method

Set $y = 0$ for the x-intercept. Set $x = 0$ for the y-intercept.

Line practice check

CHECK

R(-2, 5) and S(4, -1)

$$m = (-1 - 5) / (4 - (-2)) = -6 / 6 = -1$$

Equation

$$\begin{aligned}y - 5 &= -1(x + 2) \\y &= -x + 3\end{aligned}$$

Intercepts

$$\begin{aligned}\text{x-intercept: } &(3, 0) \\ \text{y-intercept: } &(0, 3)\end{aligned}$$

Check: both intercepts satisfy $y = -x + 3$.

Circle form

PREVIEW

Identify center and radius from standard form.

$$(x - h)^2 + (y - k)^2 = r^2$$

MODEL

$$(x + 3)^2 + (y - 2)^2 = 25$$

Center: $(-3, 2)$
Radius: 5

QUICK CHECK

$$(x - 4)^2 + (y + 1)^2 = 9$$

Center: _____
Radius: _____

Read the center using opposite signs inside the parentheses. Radius is the positive square root of r^2 .

Exit ticket and ALEKS

CLOSE

Complete the response, then plan your next Unit 1C step.

EXIT TICKET

For $T(-4, 6)$ and $U(2, -2)$, find the midpoint and slope.

- 1 Open the course dashboard and continue Unit 1C.
- 2 Finish ALEKS Sections 2.1, 2.2, and 2.4.
- 3 Use Unit 1C practice and the checkpoint before Quiz 3.

Exit key for discussion: midpoint $(-1, 2)$, slope $-4/3$