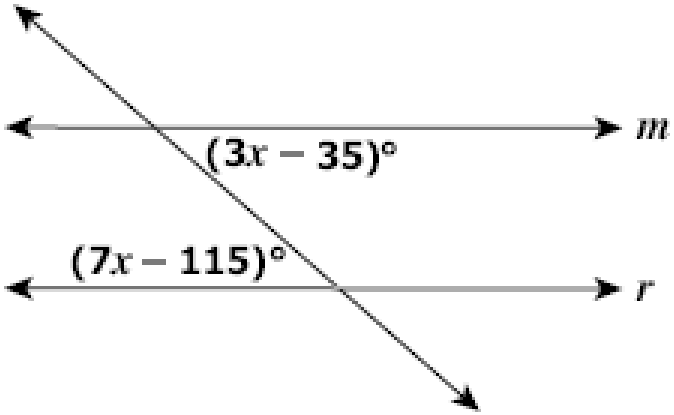
Modified and Animated By Chris Headlee
Nov 2011

CHAPTER 3 SOL PROBLEMS

SSM: Super Second-grader Methods

SOL Problems; not Dynamic Variable Problems

2 Lines m and r are cut by a transversal.



Alternate Interior

SSM:
- **both angle acute → EQUAL**
- **plug in answers to see which make them equal**

What value of x will show that line m is parallel to line r ?

F 20
G 24
H 25
J 33

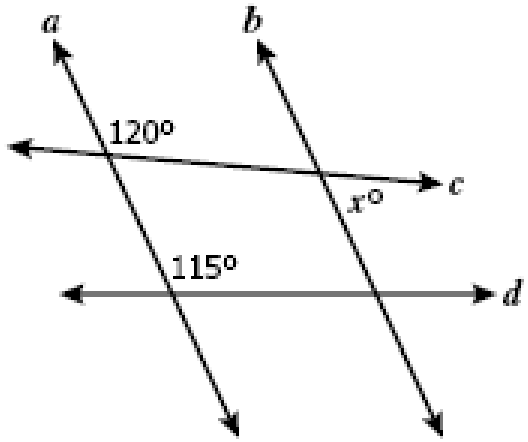
Alternate Interior angles are equal!

$7x - 115 = 3x - 35$

$4x - 115 = -35$

$4x = 80$

$x = 20$



If lines a and b are parallel, what is the value of x ?

A 120
B 115
C 65
D 60

SSM:

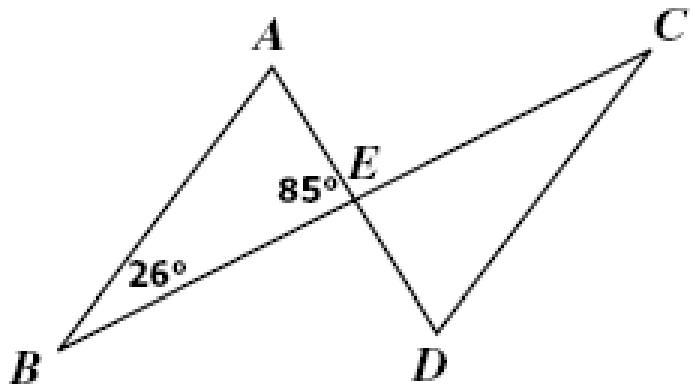
- **x is acute**
  ELIMINATE A and B
- **Magic Number is 180**
- **x + what = 180**

Angles must be formed by one transversal (line c)

x and 120 go together for a and b being parallel

x + 120 = 180
x = 60

5 For what measure of $\angle D$ is $\overline{AB} \parallel \overline{DC}$ in this figure?



A 26°
B 59°
C 69°
D 95°

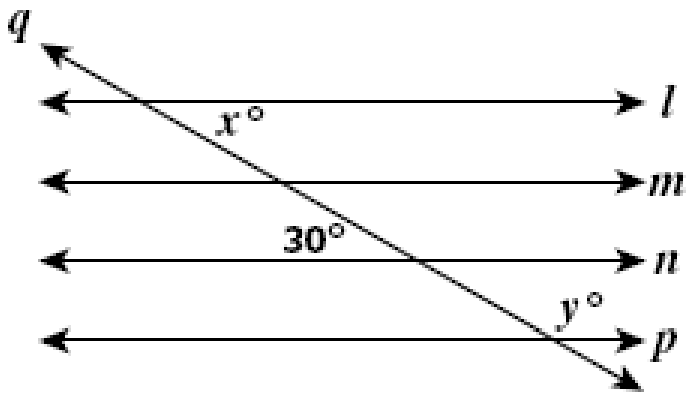
SSM:
- **Eliminate D ($\angle D$ is acute)**
- **$\angle D > \angle B$, eliminate A**

angle A and D are alternate interior angles and must be the same

$26 + 85 + m\angle A = 180$

$m\angle A = 180 - (26 + 85) = 180 - 111 = 69$

7 In the figure shown, line q is a transversal of parallel lines l, m, n, and p.



What are the values of x and y ?

A $x = 30,\ y = 30$

B $x = 30,\ y = 150$

C $x = 150,\ y = 30$

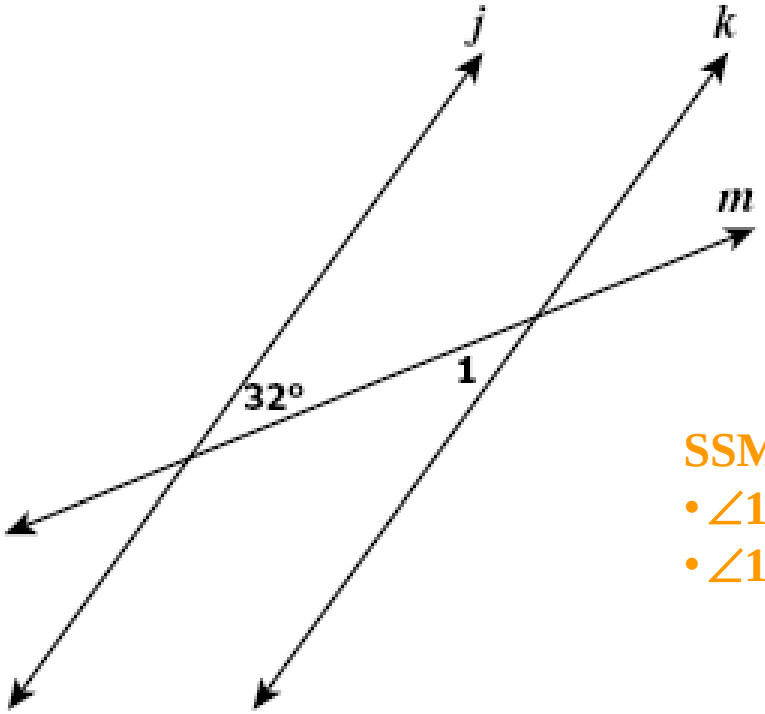
D $x = 150,\ y = 150$

SSM:

- **x is acute; eliminate C and D**
- **y is obtuse; eliminate A and C**
- **B is only answer left!**

x and 30 have to be equal (alternate interior angles between *l* and *n*)
y and the vertical angle to 30 are consecutive interior angles; so 30 + y = 180
and y must be 150

8 In the figure shown, parallel lines j and k are cut by transversal m.



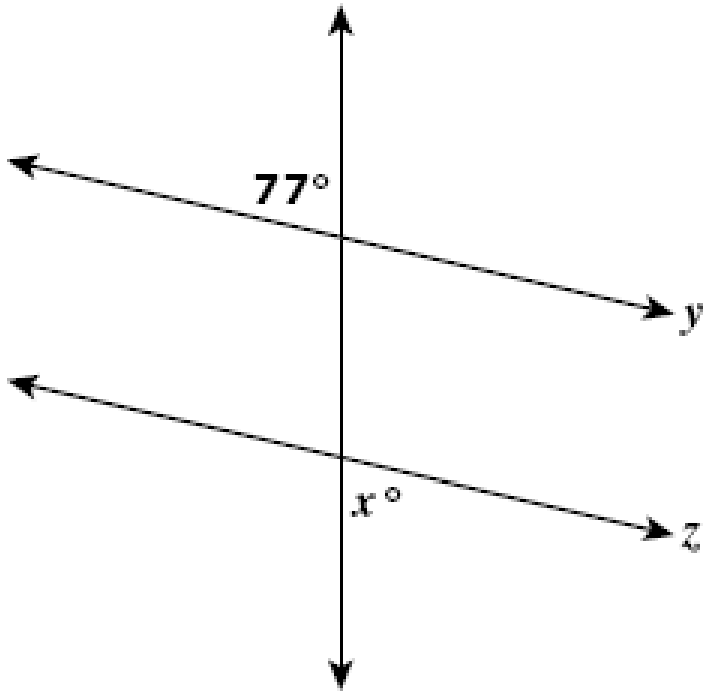
SSM:
- $\angle 1$ is acute; eliminate H and J
- $\angle 1$ looks same as 32

What is $m\angle 1$?

F 32°
G 58°
H 122°
J 148°

32 and $\angle 1$ are alternate interior angles and so are equal

9 Lines y and z are cut by a transversal.



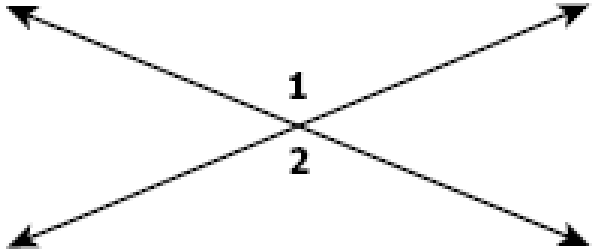
For what value of x is $y \parallel z$?

A 13
B 77
C 103
D 154

SSM:
- **x is acute; eliminate C and D**
- **x is large acute; eliminate A**

Parallel lines:
Alternate exterior angles are equal

10 In this figure, $m\angle 1 = (15x - 5)°$ and $m\angle 2 = (10x + 35)°$.



What is $m\angle 1$?

F 31°
G 65°
H 85°
J 115°

SSM:
- **∠1 is obtuse; only answer J works**

Vertical angles are equal

$15x - 5 = 10x + 35$

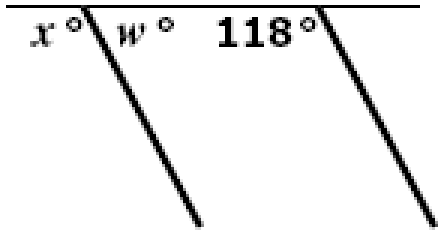
$5x - 5 = 35$

$5x = 40$

$x = 8$

Substitute: $m\angle 1 = 15(8) - 5 = 115$

11 This figure represents line segments painted on a parking lot to create parking spaces.



Which equation can be used to show that these line segments are parallel?

A $118 - w = x$

B $118 - x = w$

C $x + 118 = 180$

D $w + 118 = 180$

SSM:

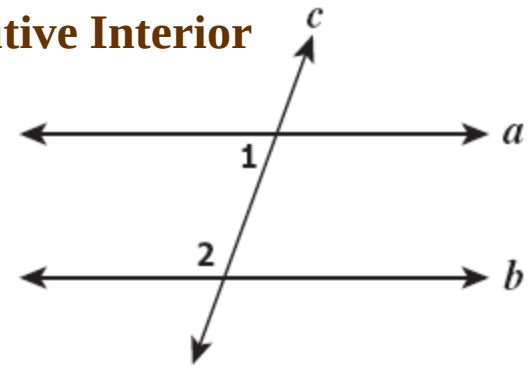
- **Our eyes tell us that x is obtuse and w is acute**
- **acute + obtuse = 180 in parallel lines**

consecutive interior angles are supplementary;
w + 118 = 180

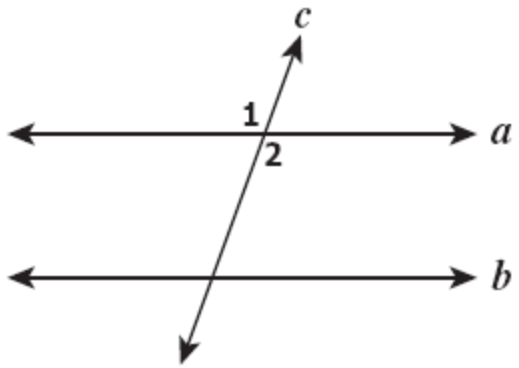
2 In each of the following figures, transversal c cuts lines a and b. In which figure are $\angle 1$ and $\angle 2$ corresponding angles?

Consecutive Interior

F

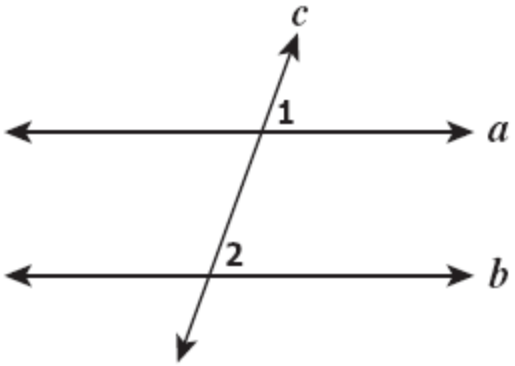


H

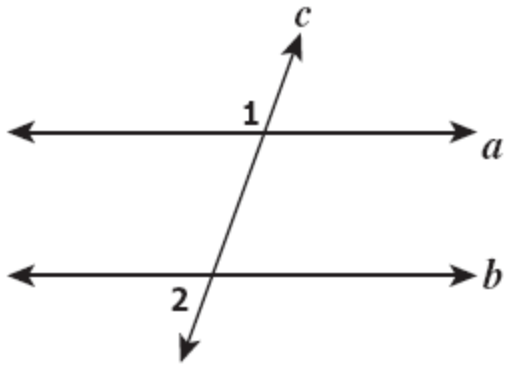


Vertical

G



J



No name

Corresponding Angles:
same side of the transversal
same relationship to other line

SSM:
- **Must be same size**
- **Two different lines involved**

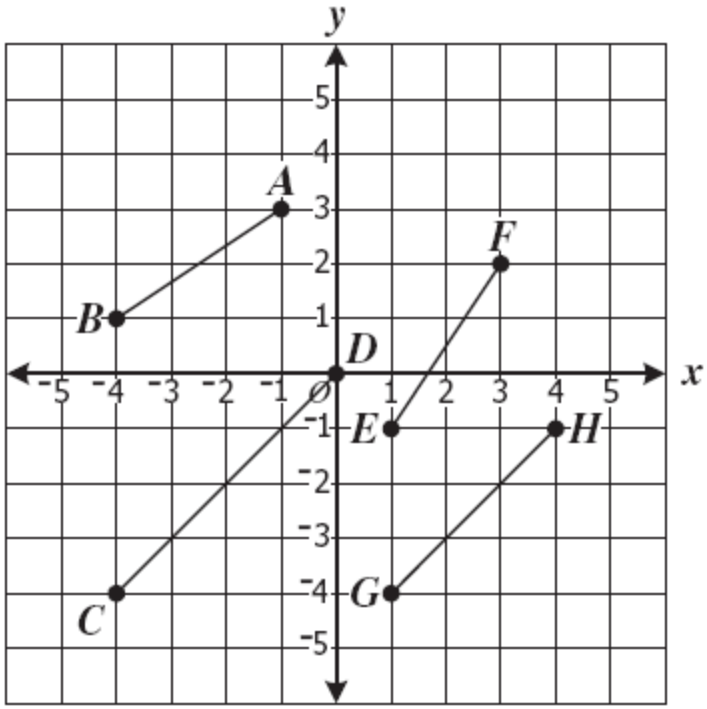
4

$m_{AB} = 2/3$

$m_{CD} = 1$

$m_{EF} = 3/2$

$m_{AB} = 1$



SSM:

- Use straight-edge tool to continue lines as far as possible
- Parallel never can cross
  EF and AB cross CD
  EF crosses GH

Which two segments in the drawing above are most likely parallel?

F $\overline{CD}$ and $\overline{GH}$

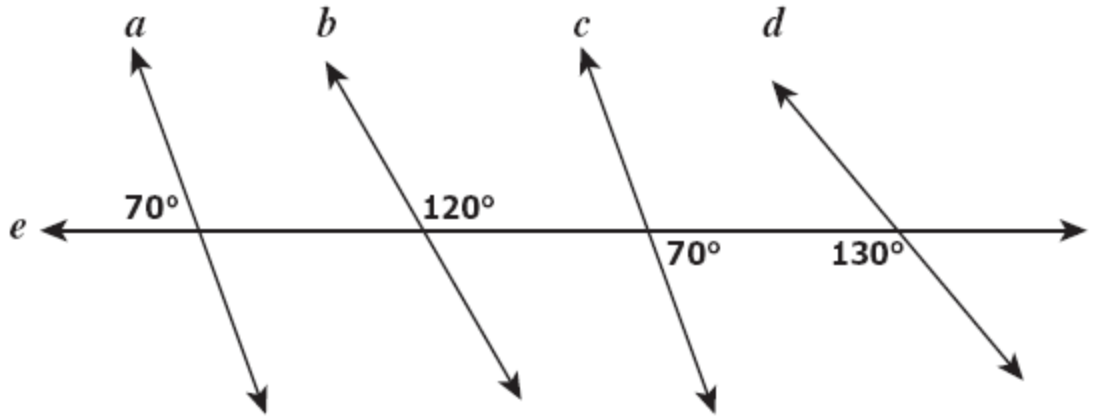
G $\overline{CD}$ and $\overline{AB}$

H $\overline{AB}$ and $\overline{EF}$

J $\overline{EF}$ and $\overline{GH}$

Parallel: same slopes
calculate slopes: $m = \Delta y / \Delta x$

7 In this figure, transversal e intersects lines a, b, c, and d.



Which lines *must* be parallel?

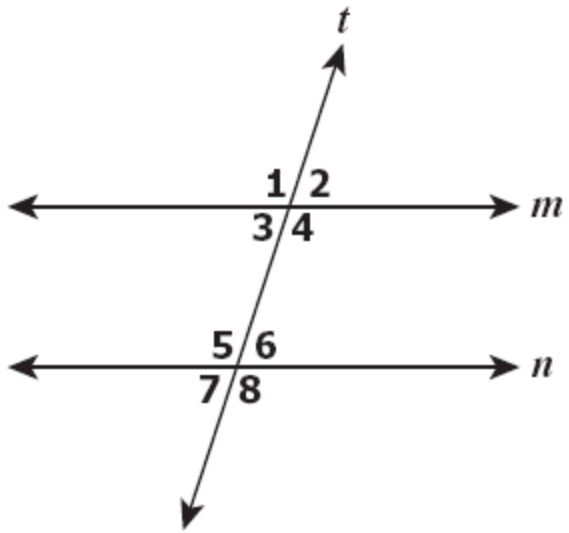
A a and c
B b and c
C b and d
D a and d

SSM:

- **Use straight-edge tool to continue lines as far as possible**
- **Parallel never can cross**
  b* crosses *a* and *c
  d crosses all of them

If lines are parallel, then all acute angles are equal and all obtuse angles are equal
Form linear pair combos with given angles
Pick which has same pairs of angles

9 In this figure, line t is a transversal of lines m and n.



SSM:

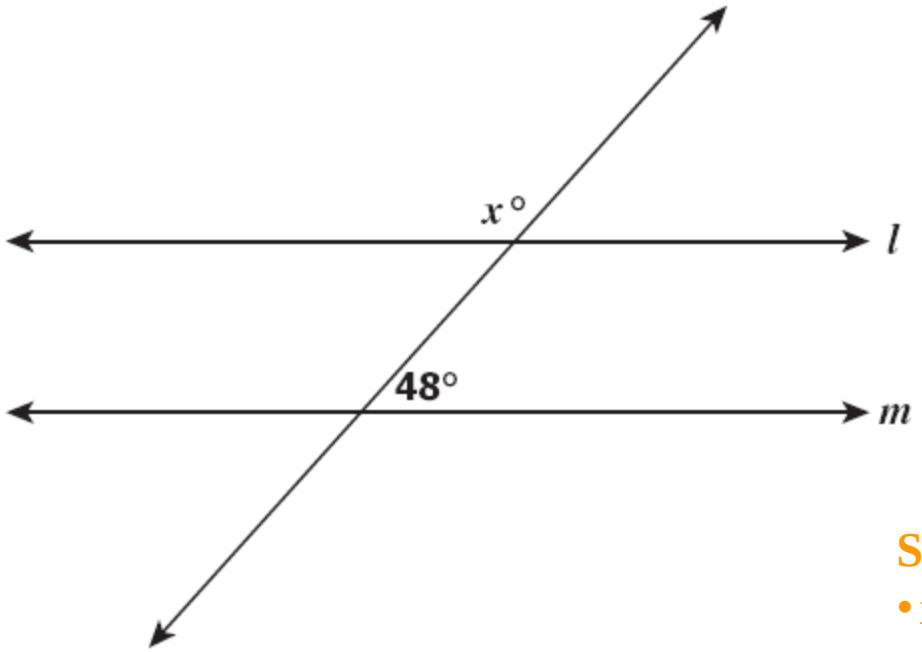
- **Angles must deal with both lines m and n:**
  angles 1 and 4 deal with m
  angles 2 and 7 deal with both
  angle 5 is obtuse → c is false
  angles 6 and 8 deal with n

Which of the following statements determines that lines m and n are parallel?

A $\angle 1 \cong \angle 4$
B $\angle 2 \cong \angle 7$
C $\angle 3$ and $\angle 5$ are complementary
D $\angle 6$ and $\angle 8$ are supplementary

Parallel lines:
Alternate exterior angles are equal

10 For what value of x is line l parallel to line m in this figure?



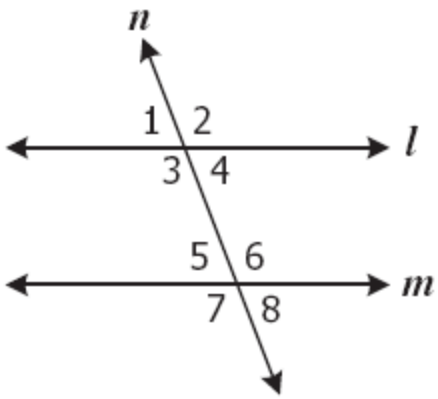
F 42
G 48
H 132
J 138

SSM:
- **x is obtuse (answers F &G are wrong)**
- **180 is a magic number**

Vertical angles are equal
Consecutive interior angles are supplementary

48 + x = 180
x = 180 - 48
x = 132

1 Lines l and m are cut by transversal n.



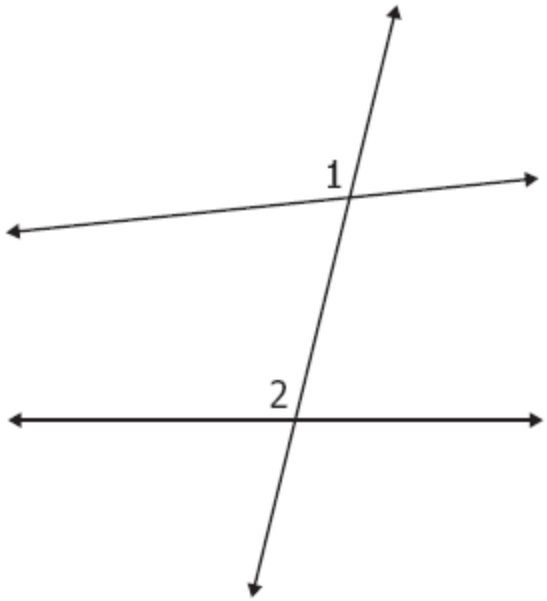
SSM:
- **pair of angles must involve both lines**
- **only one answer, A, works**

Which statement would prove $l \parallel m$?

A $m\angle 2 = m\angle 6$
B $m\angle 2 = m\angle 3$
C $m\angle 7 + m\angle 8 = 180°$
D $m\angle 3 + m\angle 5 = 90°$

Angles 2 and 6 are corresponding
Angles 2 and 3 are vertical angles (always =)
Angles 7 and 8 are a linear pair (always supplementary)
Angle 3 is obtuse so answer D is wrong

3 In this figure, two lines are cut by a transversal. Which type of angles are ∠1 and ∠2 ?

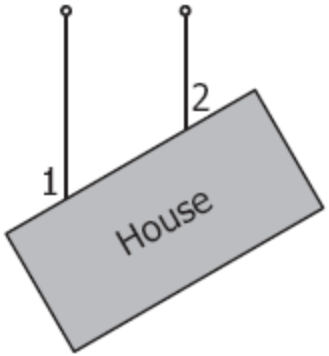


SSM:
- **Eliminate answers**
  - **A (vertical angle)**
  - **C (both on same side)**
  - **D (no such special name)**

A Vertical angles
B Corresponding angles
C Alternate interior angles
D Same-side interior angles

Angle 1 and Angle 2 are same side of transversal
and one is interior (2) and one is exterior (1) → Corresponding angles

4 Sally is using strings to mark parallel rows for a vegetable garden behind her house.



SSM:
- **Angle 2 is medium acute eliminate answers F and J**

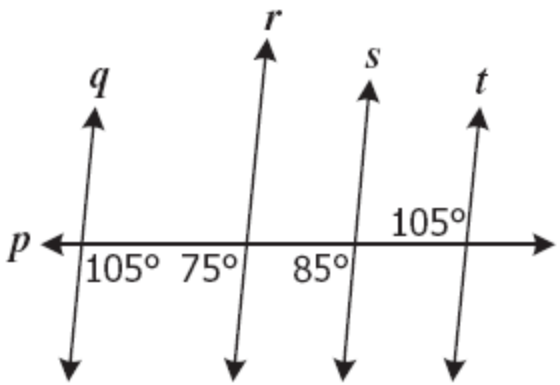
If the measure of ∠1 is 115°, what should be the measure of ∠2 ?

F 25°
G 65°
H 75°
J 115°

Angle 2 is an acute angle
Angle 1 is an obtuse angle
Acute angle and obtuse angle = 180 (magic number!)

$115 + x = 180$
$x = 65$

5 Line p is a transversal.



SSM:

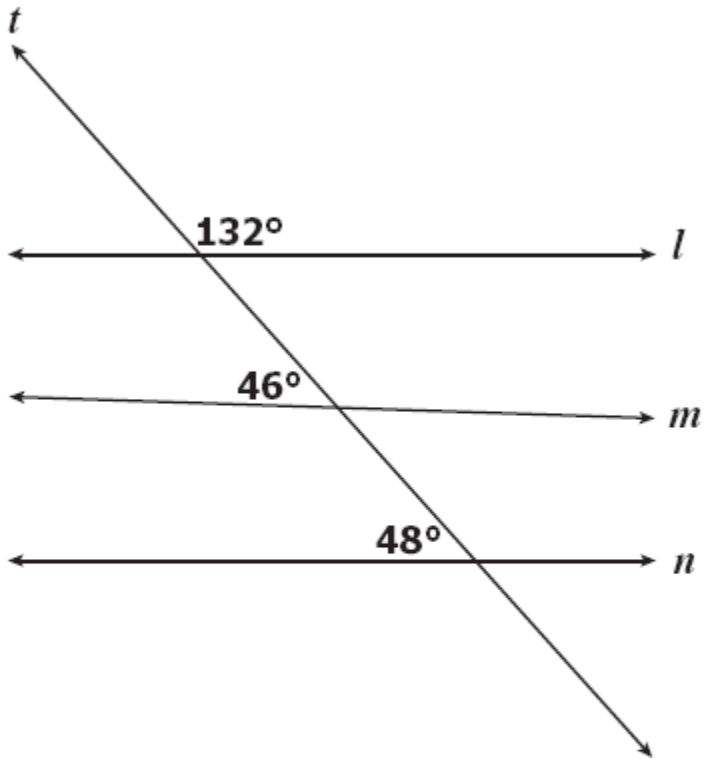
- **Use straight-edge tool to continue lines as far as possible**
- **Parallel never can cross *s* eventually will cross either *r* or *t***

For lines q, r, s, and t, which is *not* parallel to the other three?

A q
B r
C s
D t

If lines are parallel, then all acute angles are equal and all obtuse angles are equal
Form linear pair combos with given angles
Pick which does not have same pairs of angles

6 Lines l, m, and n are intersected by transversal t. The measures of some of the angles that are formed are shown.



SSM:

- Use straight-edge tool to continue lines as far as possible
- Parallel never can cross *m* eventually will cross both *l* and *n*

Which of the following statements about lines l, m, and n *must* be true?

F $l \parallel m \parallel n$

G $l \parallel m$ only

H $l \parallel n$ only

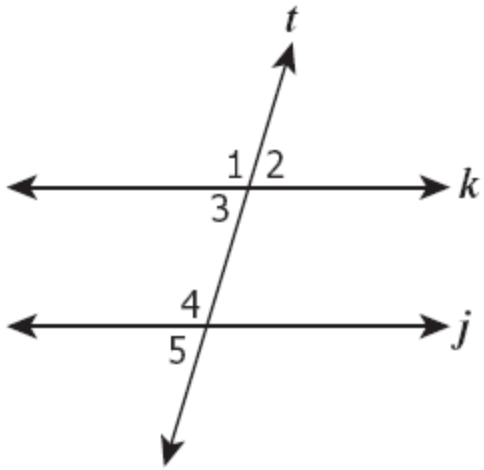
J $m \parallel n$ only

If lines are parallel, then all acute angles are equal and all obtuse angles are equal

Form linear pair combos with given angles

Pick which has same pairs of angles

7 **Transversal t intersects lines k and j as shown.**



Which of the following relationships makes $j \parallel k$?

A $\angle 2 \cong \angle 3$

B $\angle 1 \cong \angle 3$

C $\angle 4$ and $\angle 5$ are supplementary

D $\angle 3$ and $\angle 4$ are supplementary

SSM:

- **Must be same size (if ≅)**
- **Supplementary if one of each**
- **Two different lines involved**

Eliminate answers:

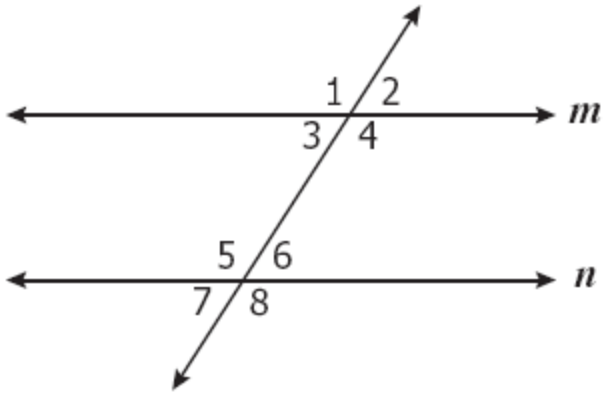
A. vertical angles

B. linear pair

C. linear pair

D. consecutive interior angles (supplementary)

11



SSM:
- **Must be same size (if ≅)**
- **Two different lines involved**

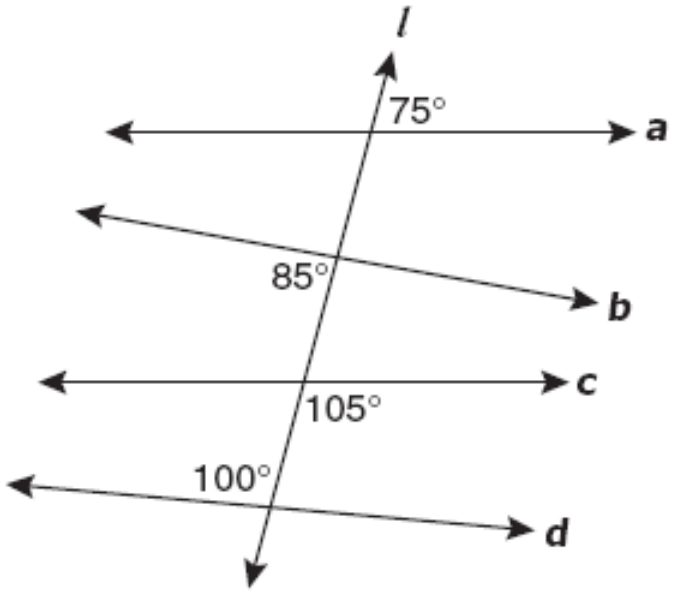
Which statement would *not* prove line m parallel to line n ?

A $\angle 7 \cong \angle 6$
B $\angle 1 \cong \angle 5$
C $\angle 4 \cong \angle 5$
D $\angle 3 \cong \angle 6$

Eliminate answers:

A. vertical angles **(only one line affected)**
B. corresponding angles
C. alternate interior angles
D. alternate interior angles

1 Transversal *l* cuts lines *a*, *b*, *c*, and *d*.



SSM:

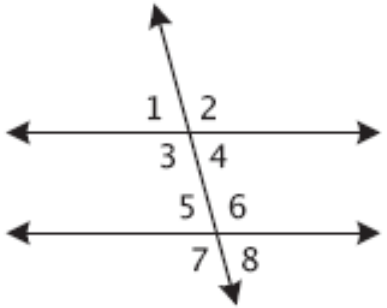
- **pair of angles must involve both lines**
- **only one answer, A, works**

Which two lines are parallel?

A *a* and *c*
B *a* and *d*
C *b* and *c*
D *b* and *d*

Angles 2 and 6 are corresponding
Angles 2 and 3 are vertical angles (always =)
Angles 7 and 8 are a linear pair (always supplementary)
Angle 3 is obtuse so answer D is wrong

2



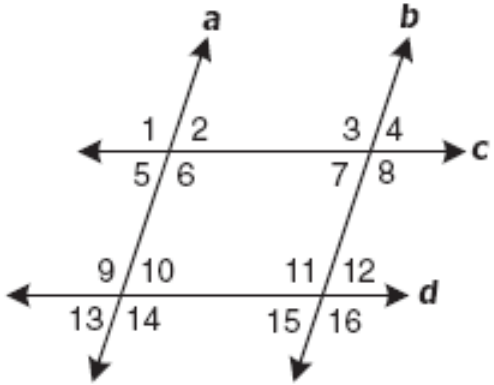
In the figure above, ∠2 and ∠6 are a pair of —

F consecutive interior angles
G alternate interior angles
H vertical angles
J corresponding angles

SSM:
- **pair of angles involve both lines (eliminates H)**
- **same side of transversal (eliminates G)**
- **both obtuse (eliminates F)**
- **only one answer, J, works**

Angles 2 and 6 are corresponding
same side of the transversal and same side (above) the other line

4 In this drawing, $a \parallel b$ and $c \parallel d$.



SSM:
- **angle 1 is obtuse**
- **angle 12 is acute**

Which angle is *not* necessarily congruent to ∠1?

F ∠3

G ∠9

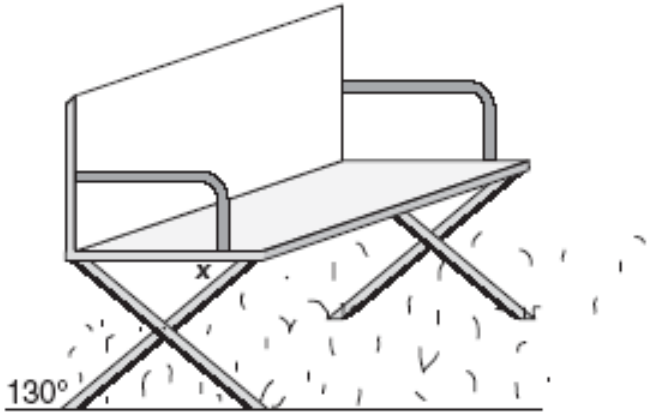
H ∠12

J ∠16

Angles 1, 3, 9, and 16 are obtuse
Angle 12 is acute

Angles 3 and 9 are corresponding
Angle 16 is an alternate exterior angle to Angle 3

5 The support legs on a bench are attached in such a way that the angle made by one leg with the ground is 130°.



SSM:
- **x is acute**
- **180 is magic number**
- **180 – 130 = 50**

What must the measure of the angle marked *x* be in order for the seat of the bench to be parallel to the ground?

A 50°

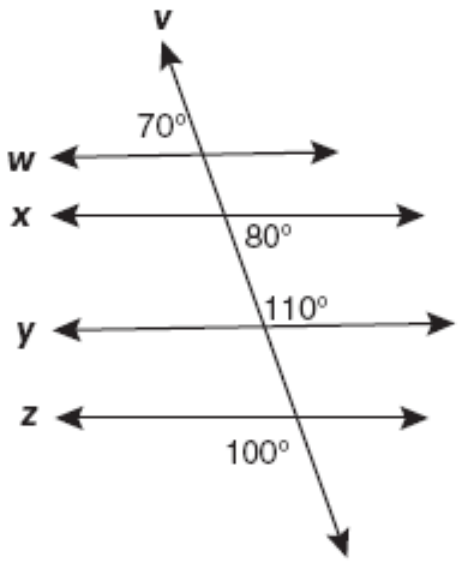
B 65°

C 90°

D 130°

No special relationship between x and 130.
Angle x is alternate interior with the angle that forms a linear pair with 130
So x + 130 = 180, then x = 50

6 Line v is a transversal.



SSM:
- **extend lines as far as possible**
- **w and x intersect**
- **y and z intersect**

Which is a true statement?

F $w \parallel y$ and $x \parallel z$

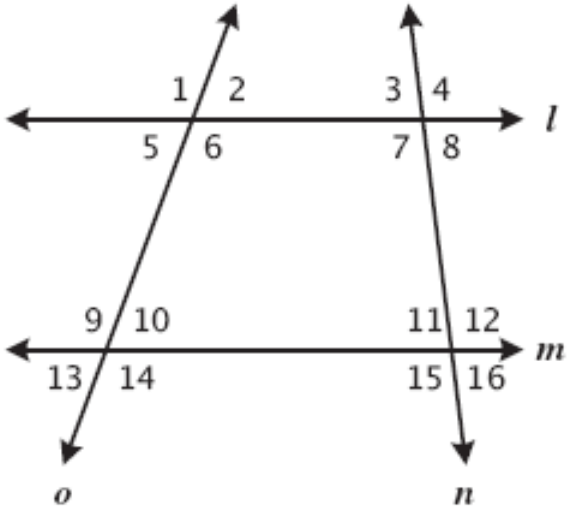
G $w \parallel x$ and $y \parallel z$

H $w \parallel z$ and $x \parallel y$

J $w \parallel x$ and $x \parallel y$

Make linear pair combinations for each line
w: 70, 110; x: 80, 100; y: 110, 70; z: 100, 80
w and y match up and x and z match up

7



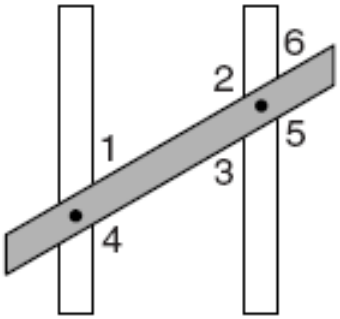
In the drawing above, ∠4 and ∠12 are —

A alternate interior angles
B consecutive interior angles
C corresponding angles
D a linear pair

SSM:
- **4 and 12 are same side of n**
- **4 is exterior and 12 is interior**
- **corresponding**

Angles 4 and 12 are corresponding
They are on the same side of n so A is incorrect
Angle 4 is exterior so B is incorrect
They aren't on the same line so D is incorrect

8 A carpenter nailed a board across two beams, forming the angles shown.



Which equal measures would ensure the beams are parallel?

F $m\angle 1 = m\angle 2$

G $m\angle 1 = m\angle 3$

H $m\angle 2 = m\angle 5$

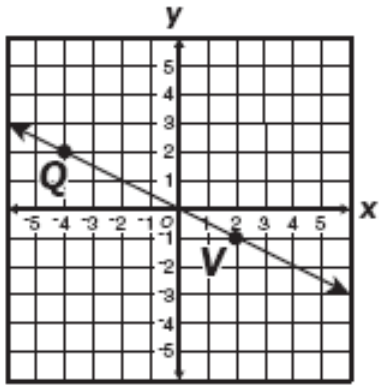
J $m\angle 3 = m\angle 4$

SSM:

- **pair of angles must involve both lines**
- **must be same classification**
- **only one answer, G, works**

Angles 1 and 2 are consecutive interior (supplementary)
Angles 2 and 5 are vertical angles (always =)
Angles 3 and 4 are consecutive interior (supplementary)
Angles 1 and 3 are alternate interior (equal)

41



SSM:
- **falling → negative slope**
- **less than a one to one change**

What is the apparent slope of $\overleftrightarrow{QV}$?

A -2

B $-\frac{1}{2}$

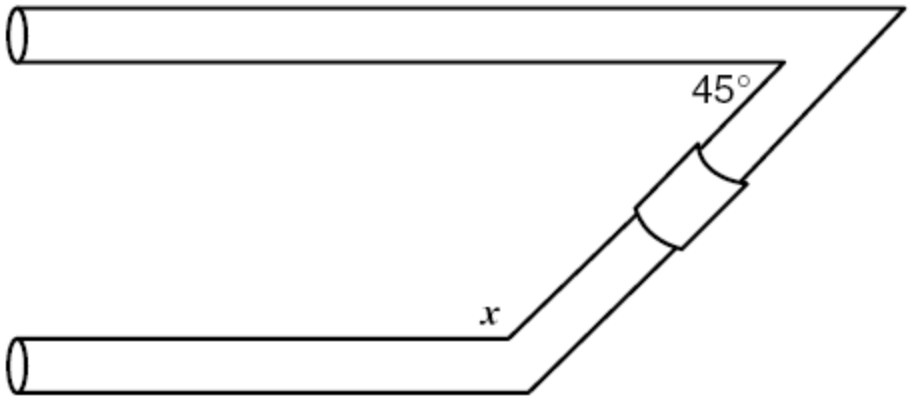
C $\frac{1}{2}$

D 2

slope = $\Delta y / \Delta x$

$$\frac{(2 - -1)}{(-4 - 2)} = \frac{3}{-6} = \frac{1}{-2}$$

2



Two parallel sections of pipe are joined with a connecting pipe as shown. What is the value of x?

F 90°

G 115°

H 135°

J 160°

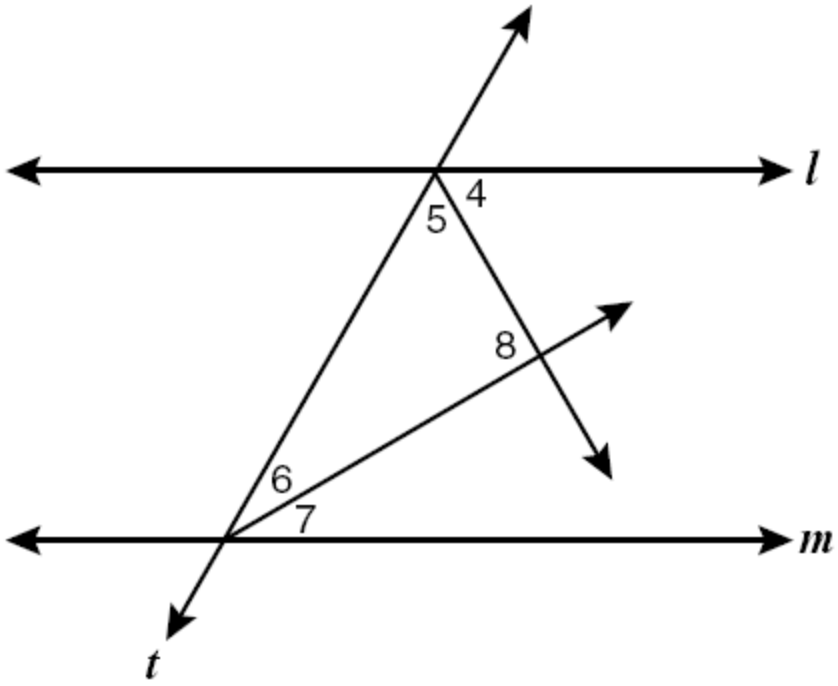
SSM:

- **angle is obtuse**
- **180 is "magic" number**
- **180 – 45 = 135**

∠x is a consecutive interior angle with 45 so its supplementary

180 – 45 = 135

3 Parallel lines l and m are cut by transversal t, $m\angle 4 = m\angle 5$, and $m\angle 6 = m\angle 7$.



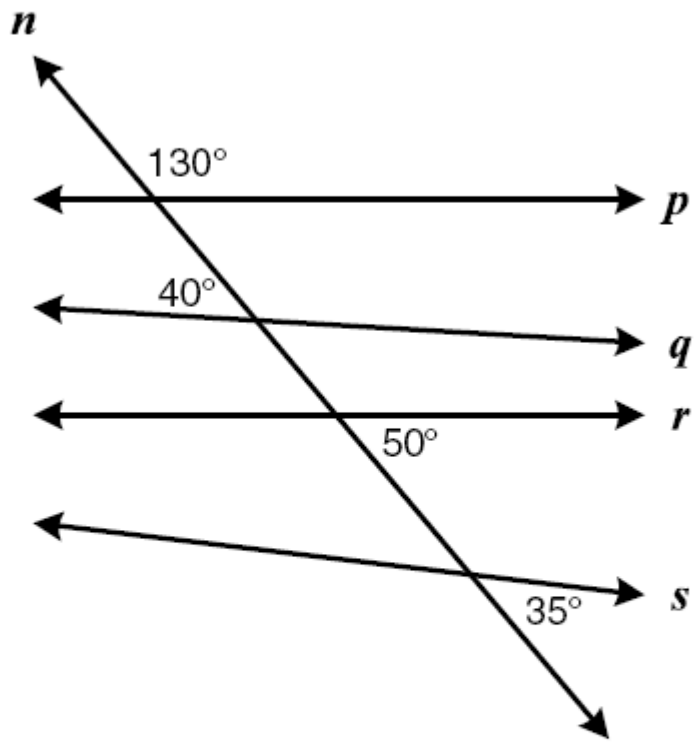
What is the measure of $\angle 8$?

A 120°
B 90°
C 65°
D 45°

SSM:
- use corner of scratch paper to check and see if angle is 90

Angles 4 and 5 are equal
Angles 6 and 7 are equal
Together they add to 180 → $2(\angle 5)+2(\angle 6) = 180$
so angle 5 + 6 = 90
therefore angle 8 = 90

5 Line n intersects lines p, q, r, and s, forming the indicated angles.



Which two lines are parallel?

A p and q

B p and r

C q and r

D r and s

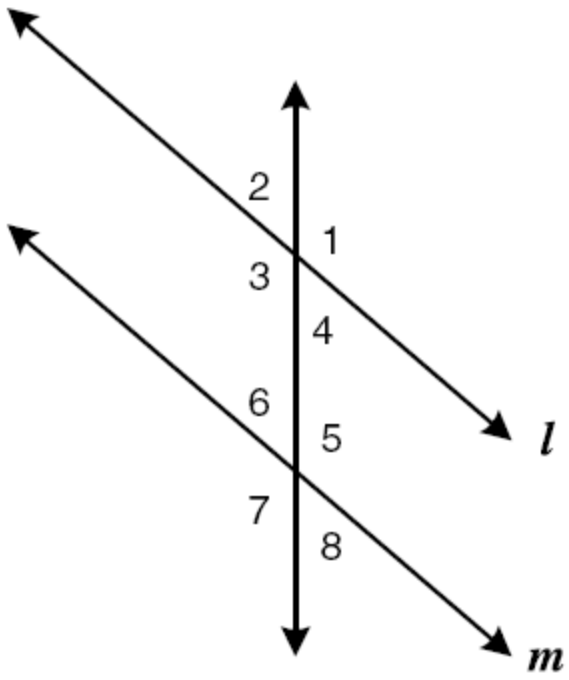
SSM:

- extend lines using ruler
- p and q intersect
- q and r intersect
- r and s intersect

form linear pair numbers for each line

lines with same numbers are parallel

6



SSM:

- **angles must be with both lines**
- **angles must be same size**

F, G, H are wrong

Which will prove that line *l* is parallel to line *m*?

F $\angle 2 \cong \angle 7$

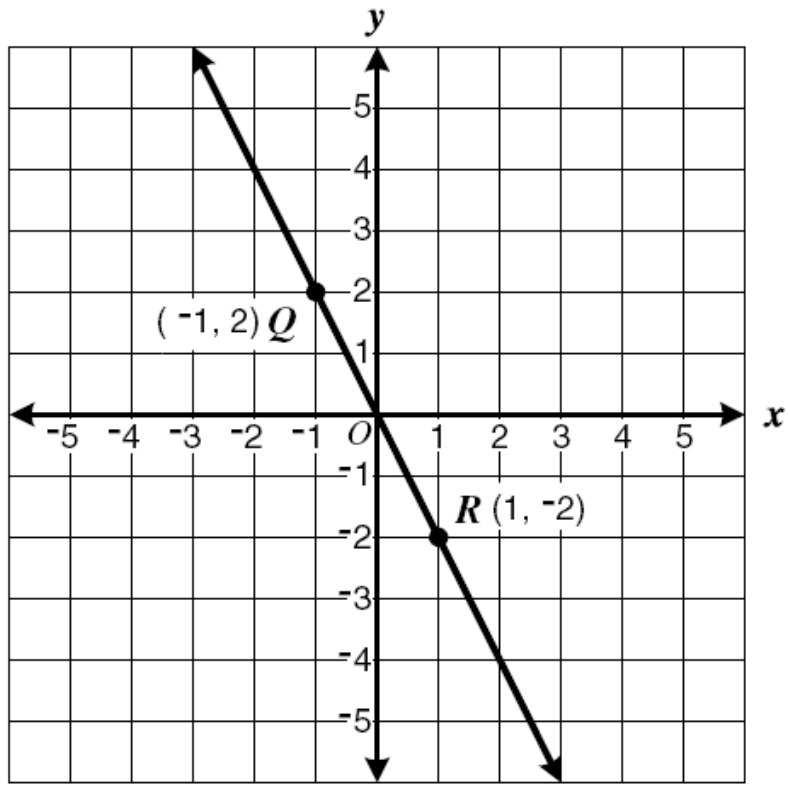
G $\angle 3 \cong \angle 6$

H $\angle 5 \cong \angle 2$

J $\angle 7 \cong \angle 1$

Angles 1 and 7 are alternate exterior angles

7



Which two points determine a line parallel to $\overleftrightarrow{QR}$?

A (1, 1) and (2, −1)

B (−1, −1) and (−2, −3)

C (1, 4) and (5, 2)

D (2, 1) and (−2, −1)

SSM:

- **plot points and draw the lines connecting them**

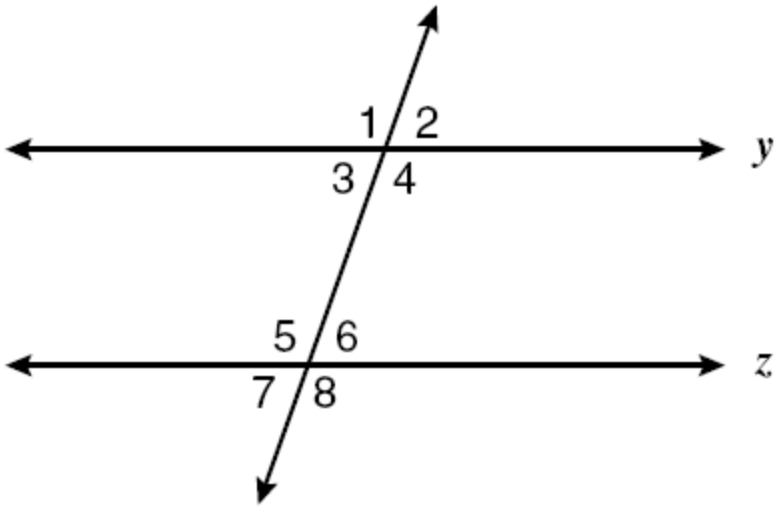
slope, m = $\frac{y_2 - y_1}{x_2 - x_1}$

Slope of QR is -2

Slopes of B and D are positive

Slope of C is -1/2

8 Given: m∠1 = 110°



Which must be true if $y \parallel z$?

F m∠8 = 100°

G m∠7 = 110°

H m∠6 = 80°

J m∠5 = 110°

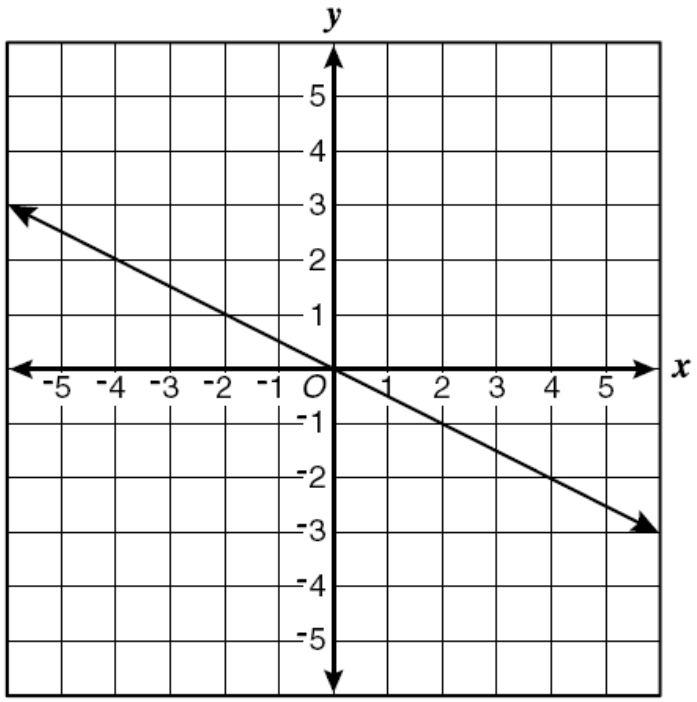
SSM:

- **parallel lines say only one obtuse angle measurement and only one acute angle measurement**
- **angle 7 is acute**

Angles 1 and 8 are alternate exterior angles, but are not equal

Angles 1 and 5 are corresponding angles and have equal measures!

42



What is most likely the slope of the line graphed above?

F -1

G $-\frac{1}{2}$

H $\frac{1}{2}$

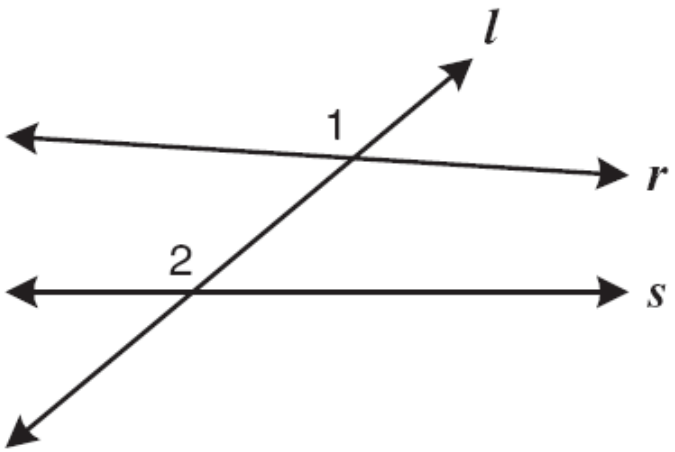
J 1

SSM:

- **falling → slope is negative**

- **Slope, m = $\frac{y_2 - y_1}{x_2 - x_1} = \frac{0 - -2}{0 - 4} = \frac{2}{-4} = -1/2$**

2 The figure shows line l intersecting lines r and s.



In the figure, ∠1 and ∠2 are —

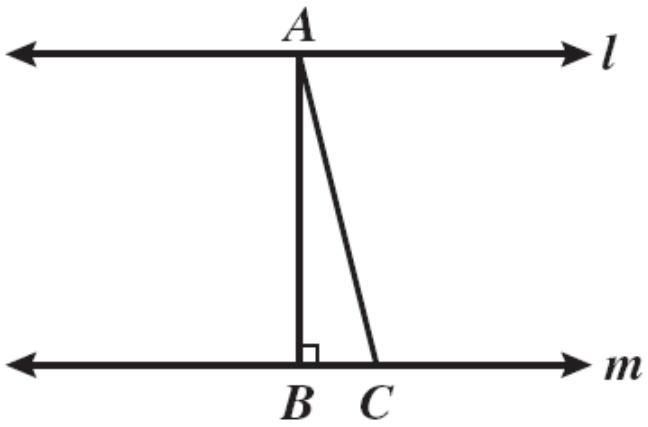
F alternate interior angles
G alternate exterior angles
H corresponding angles
J consecutive interior angles

SSM:

- **same side of common line (alternates - wrong)**
- **one between and one outside (consecutive interior angles – wrong)**

Angles are on the same side of transversal
One is interior (2) and one is exterior (1)
Corresponding angles

5



SSM:

- **Use your eyes and scrap paper corner!**
- **two perpendiculars → parallel**

Which statement would be sufficient to prove that line l is parallel to line m?

A $\overline{AC} \perp m$

B $\overline{AB} \perp l$

C $\overline{AC} \perp l$

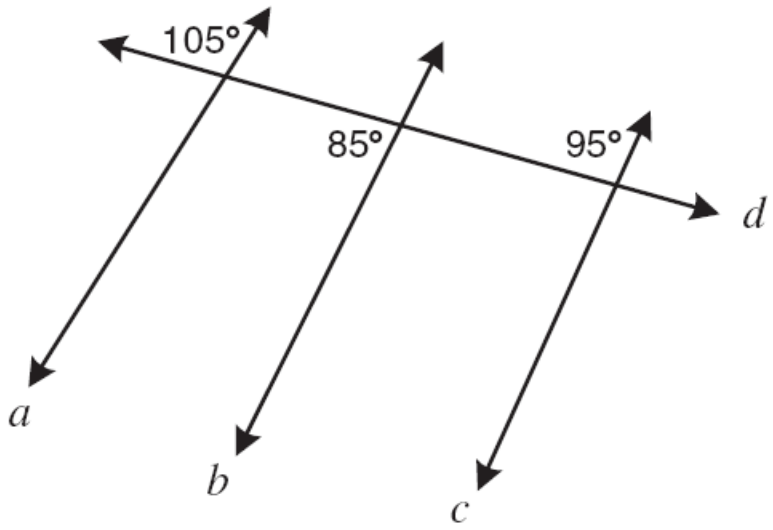
D $\overline{AB} \perp \overline{AC}$

angle B is 90

angle A + B = 180, so angle A = 90

AB must be perpendicular to line l

6 In this diagram, line d cuts three lines to form the angles shown.



Which two lines are parallel?

F a and b

G a and c

H b and c

J No lines are parallel.

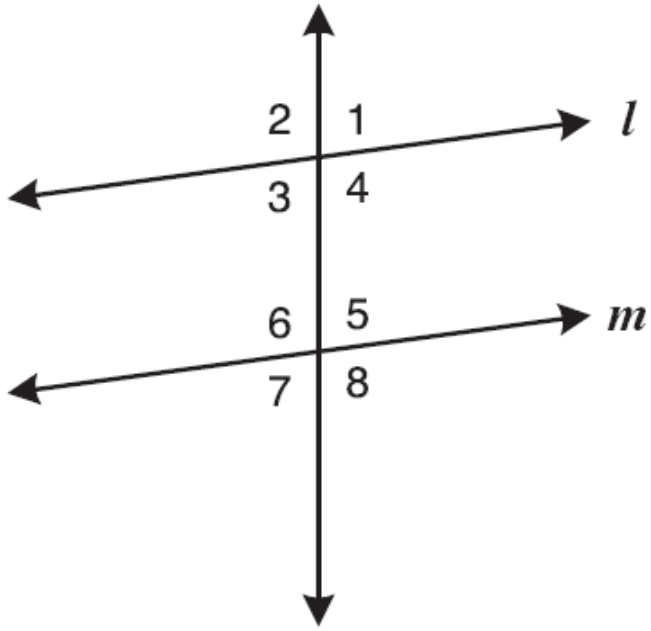
SSM:

- **extend lines using line drawing tool as far as possible**

Form linear pairs with given numbers

If any are the same numbers, then they are parallel

8



SSM:
- **must involve both lines**
- **must be the same size**

Which condition will guarantee that line l is parallel to line m?

F $\angle 1 \cong \angle 3$

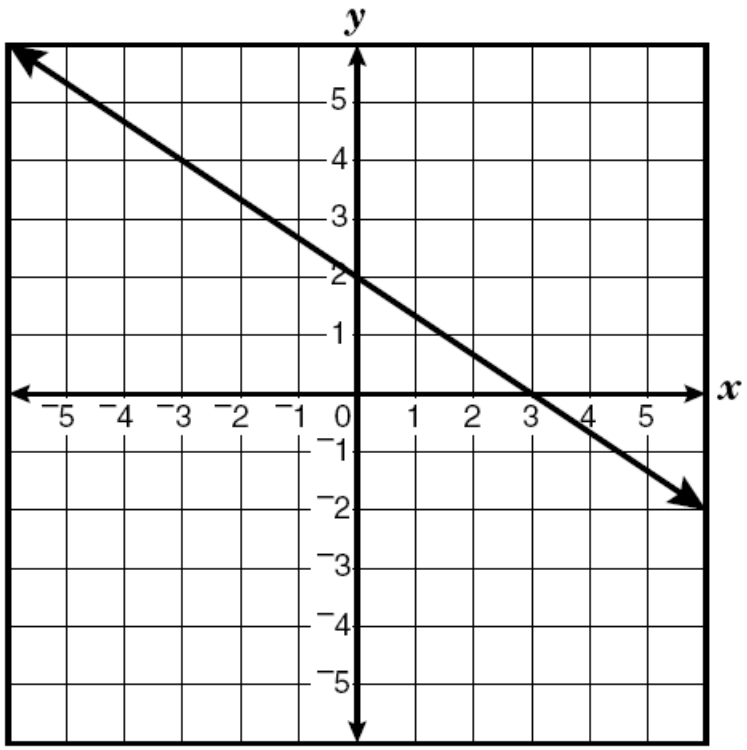
G $\angle 1 \cong \angle 6$

H $\angle 6 \cong \angle 5$

J $\angle 3 \cong \angle 5$

Angles 1 and 3 are vertical angles
Angles 1 and 6 are different sizes
Angles 6 and 5 are linear pairs
Angles 3 and 5 are alternate interior

44



Which is most likely the slope of the line graphed?

F -4

H $-\frac{2}{3}$

G $-\frac{3}{2}$

J 4

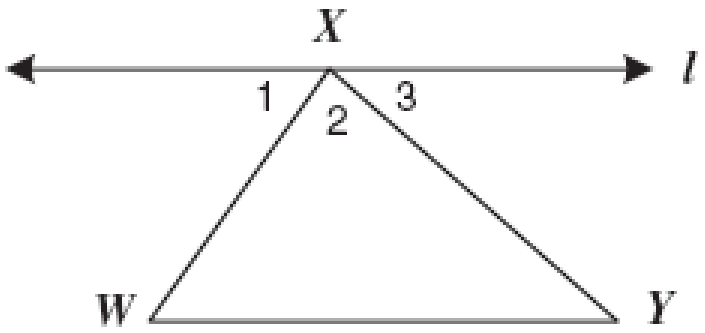
SSM:

- **falling → negative slope**
- **less than a one to one change**

slope = $\Delta y / \Delta x$

$$\frac{(2 - 0)}{(0 - 3)} = \frac{2}{-3} = \frac{2}{-3}$$

2



SSM:
- **looking H doesn't look true**

If $\angle 3 \cong \angle Y$, which of the following must be true?

F $\angle W \cong \angle Y$

G $\overline{WX}$ is perpendicular to $\overline{XY}$

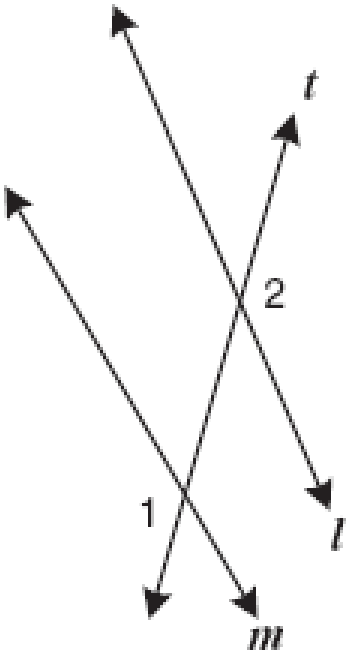
H $\angle W \cong \angle 2$

J Line l is parallel to $\overline{YW}$

angle 3 and angle y are alternate interior angles

so WY is parallel to line l

4 **In the figure, line t is a transversal for lines l and m.**



Which of the following best describes the relationship between ∠1 and ∠2?

F Alternate interior angles

G Consecutive interior angles

H Corresponding angles

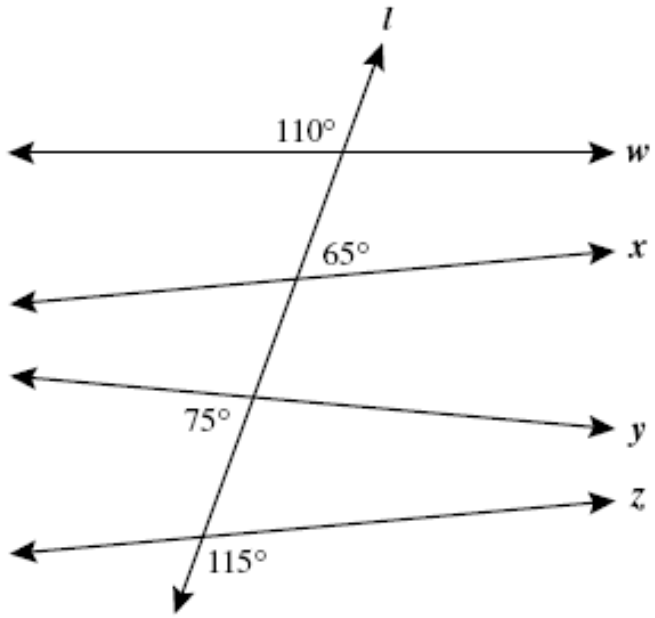
J Alternate exterior angles

SSM:

- **opposite sides of t**
- **not between l and m**

opposite sides → alternate
both outside → exterior

5 Line l intersects lines w, x, y, and z, forming angles with measures as indicated on the drawing.



Which two lines are parallel?

A w and x

B x and z

C y and z

D w and y

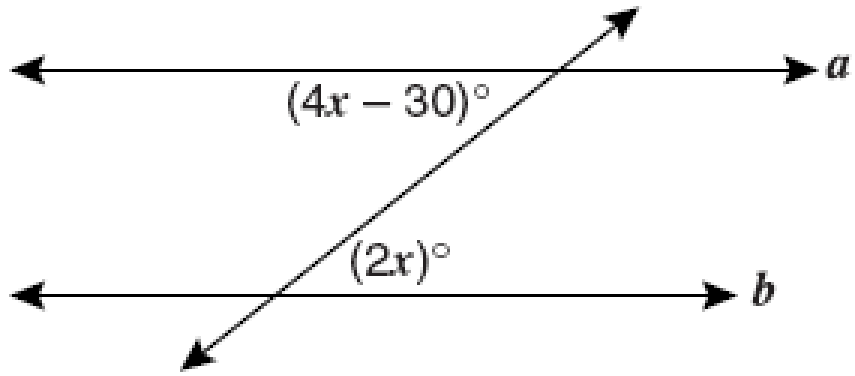
SSM:

- **form linear pair numbers**
- **which are the same**

110, 70 for w
115, 65 for x
75, 105 for y
65, 115 for z

so x and z have the same and are parallel

6



SSM:
- **angle is medium acute**
- **plug in answers to see which fit**
- **F too small, J too big**

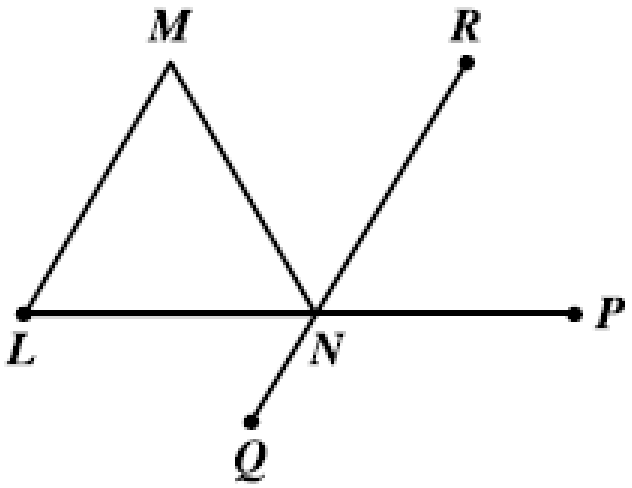
Which value for x will make a parallel to b?

F 5
G 15
H 20
J 35

alternate interior angles

$$4x - 30 = 2x$$
$$4x = 2x + 30$$
$$2x = 30$$
$$x = 15$$

7 In the figure drawn below, $\overleftrightarrow{LM}$ and $\overleftrightarrow{QR}$ are parallel and $m\angle M = m\angle L = 60°$.



What is $m\angle QNP$?

A 90°
B 120°
C 150°
D 180°

SSM:
- **angle is obtuse**
  A and D are wrong

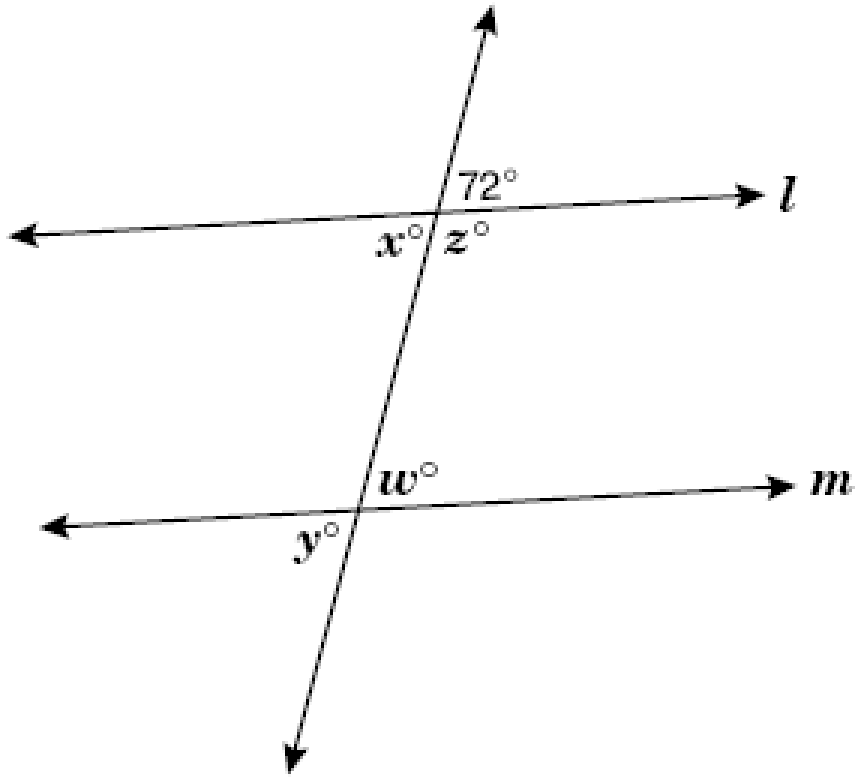
angle L and angle RNP are corresponding angles

angle RNP + angle QNP = 180 (linear pair)

60 + x = 180

x = 120

8



Which additional piece of information would verify $l \parallel m$?

F $x = 72$

G $y = w$

H $z = 108$

J $x = w$

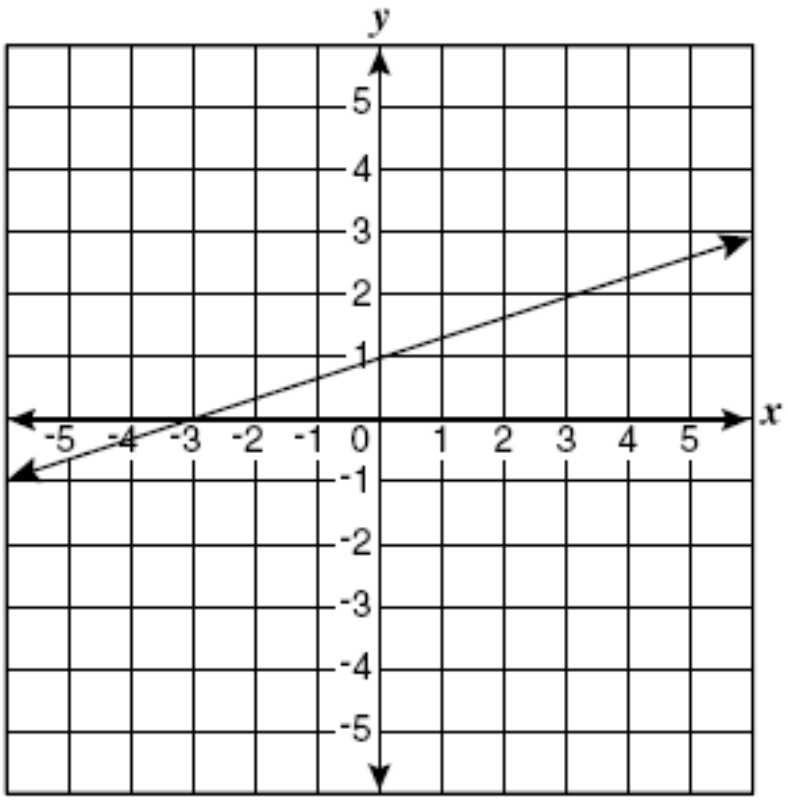
SSM:

- **x = 72 vertical angles**
- **if w = 72 then parallel**

opposite sides → alternate
both inside → interior

x and w are alternate interior angles

42



What is most likely the slope of the line graphed above?

F $\frac{1}{3}$

G $\frac{2}{3}$

H 2

J 3

SSM:

- **positive slope (increasing)**
- **compare to y = x (graph it)**
- **slope is less than 1**

slope = $\Delta y / \Delta x$

$$\frac{(1 - 0)}{(0 - -3)} = \frac{1}{3}$$

6 Line m contains points $(1, -3)$ and $(2, 2)$. Which of the following pairs of points define a line parallel to line m?

F $(0, 0)$ and $(-1, 1)$
G $(0, 0)$ and $(1, 5)$
H $(1, 1)$ and $(6, 2)$
J $(-4, 0)$ and $(5, 5)$

SSM:

- **graph all points involved on graph paper and draw lines**

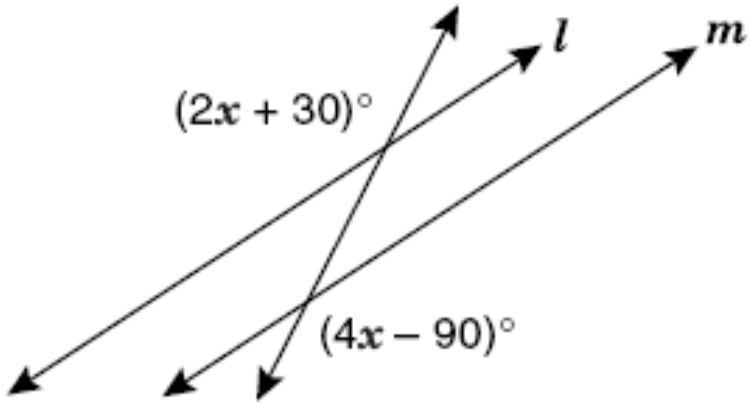
parallel lines have equal slopes (slope = change in y / change in x

slope of line m is (-3 – 2) / (1 – 2) = (-5) / (-1) = 5

figure slopes for each answer

F slope = -1
G slope = 5
H slope = 1/5
J slope = 5/9

7



What value for x will show that lines l and m are parallel?

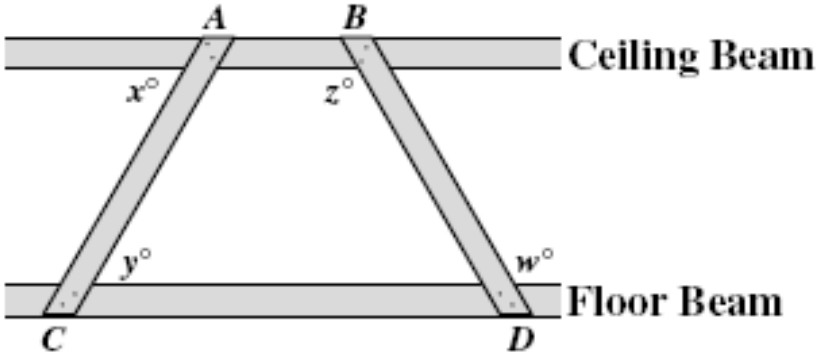
A 25
B 30
C 40
D 60

SSM:
- **angles are both obtuse**
- **plug in answers to see which are equal**

Alternate exterior angles

$$2x + 30 = 4x - 90$$
$$2x + 120 = 4x$$
$$120 = 2x$$
$$60 = x$$

8



SSM:

- **look at picture and see which angles could be equal (by sight)**

A construction engineer needs to make sure a ceiling beam is parallel to its corresponding floor beam. Using the drawing as a guide, which pair of measurements is sufficient to show the beams are parallel?

F $x = z$

G $y = w$

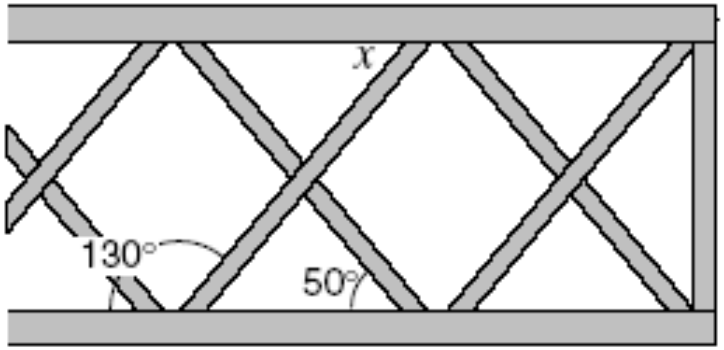
H $x = y$

J $y = z$

angles x and y form alternate interior angles

if they are equal then the beams are parallel

2 George used a decorative fencing to enclose his deck.



Using the information on the diagram and assuming the top and bottom are parallel, the measure of $\angle x$ is —

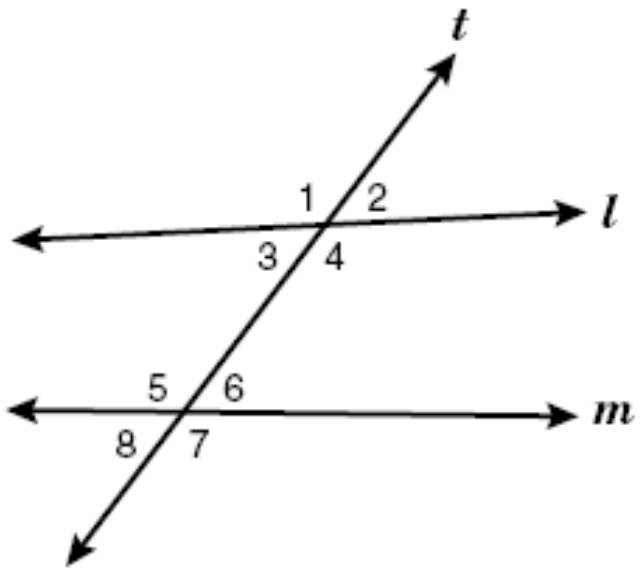
F 50°
G 80°
H 100°
J 130°

SSM:
- **x is an acute angle**

In parallel construction, all acute angles are equal and all obtuse angles are equal

so since x is acute it must be 50

4 In the figure, lines l and m are cut by the transversal t forming the angles shown.



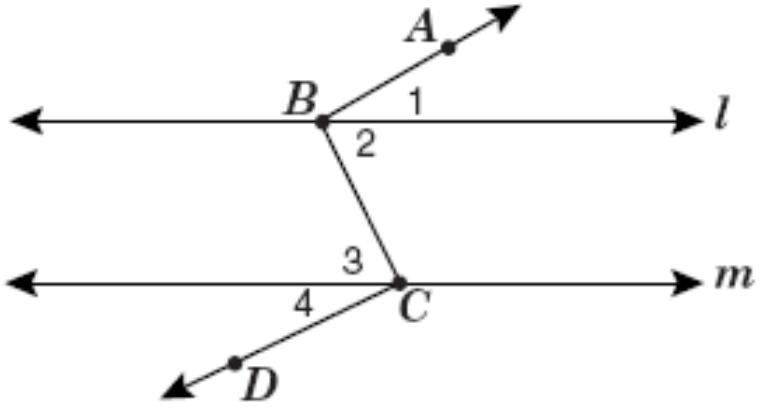
∠3 and ∠6 are —

F Vertical angles
G Corresponding angles
H Alternate interior angles
J Alternate exterior angles

SSM:
- **opposite sides of t**
- **both inside of l and m**

Alternate Interior angles → both inside of l and m and on opposite sides of the transversal t

5 Use this figure to answer the following.



$\overrightarrow{BA}$ is parallel to $\overrightarrow{CD}$ if —

A $m\angle 1 = m\angle 2$

B $m\angle 3 = m\angle 4$

C $m\angle 1 + m\angle 2 = 90$

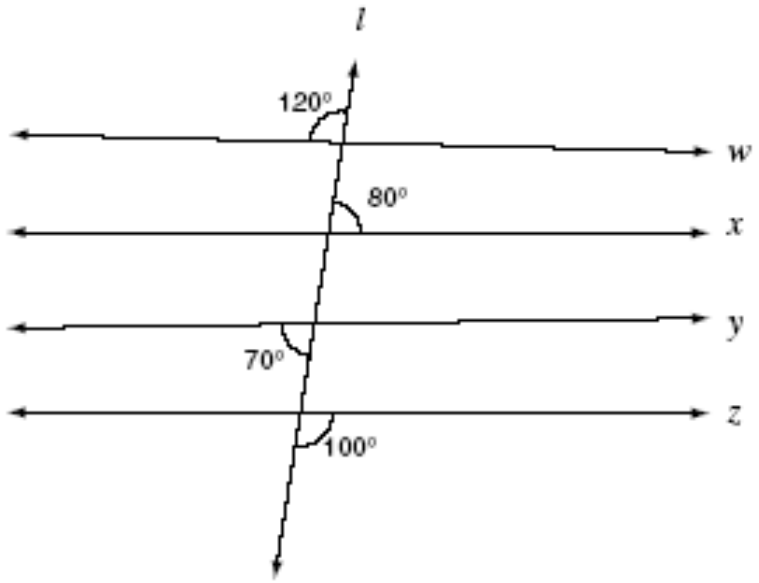
D $m\angle 1 + m\angle 2 = m\angle 3 + m\angle 4$

SSM:

- **have to involve both rays answers A, B and C do not**

angles 1 and 2 combined and angles 3 and 4 combined form alternate interior angles; so answer D is correct

6



Line l intersects lines w, x, y, and z. Which two lines are parallel?

F Line w and line x

G Line w and line y

H Line x and line z

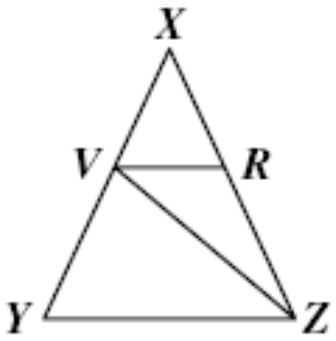
J Line y and line z

SSM:
- **extend lines as far as possible**
- **see which intersect**

form linear pair combinations
compare to see which ones are the same
- **w: 120, 60**
- **x: 80, 100**
- **y: 70, 110**
- **x: 100, 80**

x and z

7 The measure of $\angle YZV$ is 40° and the measure of $\angle XYZ$ is 65°.



Which of these angles *must* measure 40° in order for $\overline{VR}$ to be parallel to $\overline{YZ}$?

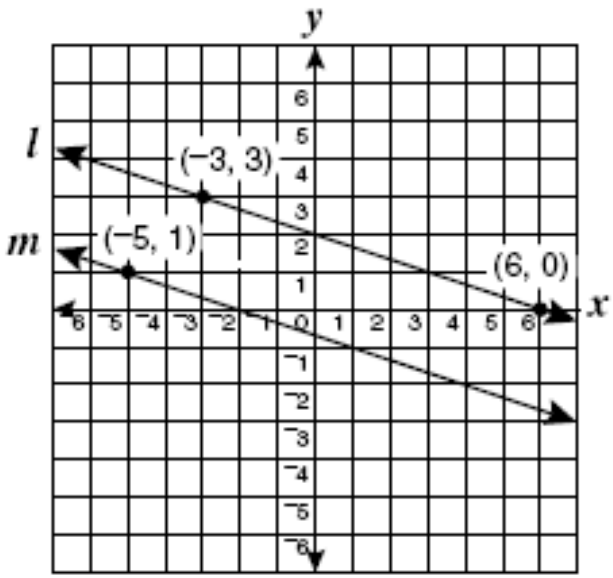
A $\angle YVZ$
B $\angle ZVR$
C $\angle ZYV$
D $\angle VRX$

SSM:
- **looking for an angle involving VR**
- **and one that's acute**

angle ZVR is an alternate interior angle to YZV

if they are equal, then line segments are parallel

8 Lines l and m contain the points shown.



Which of the following points *must* lie on line m in order for lines l and m to be parallel?

F $(0, -2)$
G $(0, -1)$
H $(1, -1)$
J $(4, -1)$

SSM:

- **plot each point on graph and see which is on the line**

slopes must be the same

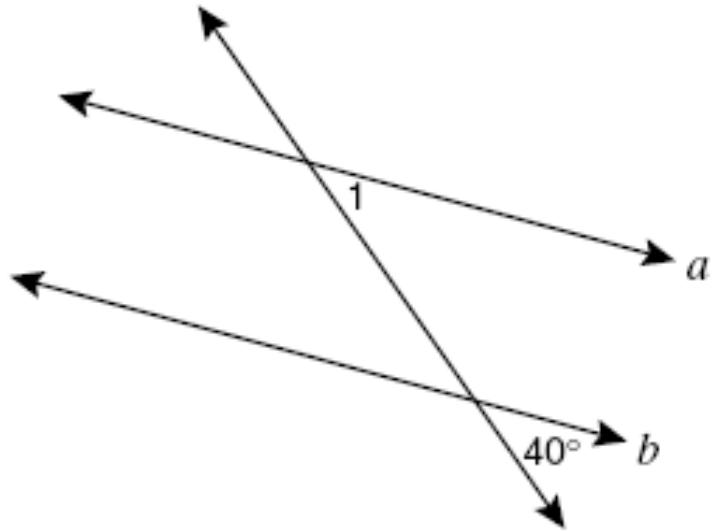
$$m = \frac{y_2 - y_1}{x_2 - x_1} = \text{slope}$$

slope of l is -1/3

use each answer to figure slope

F: -3/5
G: -2/5
H: -1/3
J: -2/9

1



If line a is parallel to line b, what is $m\angle 1$?

A 40°
B 50°
C 90°
D 140°

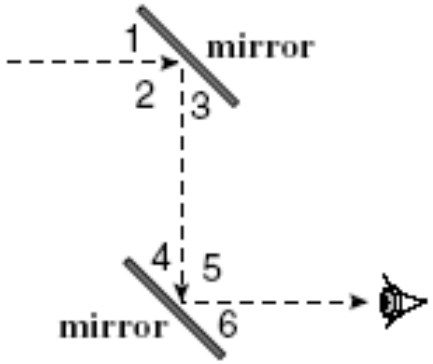
SSM:

- **angle 1 is acute eliminates C and D**

Angles 1 and the 40° angle are corresponding angles

If lines are parallel, then corresponding angles are equal

4



SSM:

- **angle 6 is medium acute**
- **compare with folded corner of scrap paper, looks equal to 45**

This diagram shows how a periscope works. If the two mirrors are parallel and $\angle 1 \cong \angle 3$, what is $m\angle 6$ when $m\angle 2 = 90°$?

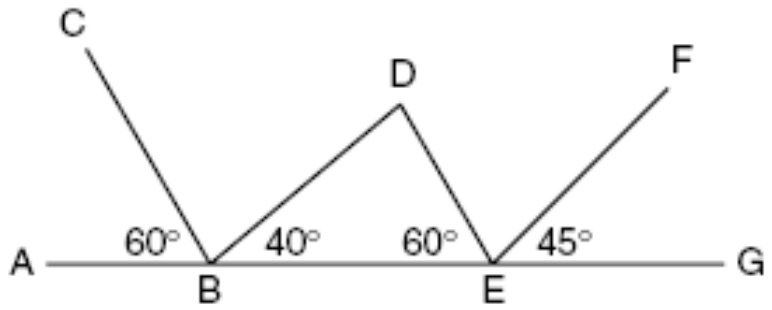
F 30°
G 45°
H 50°
J 60°

Angles 1, 2 and 3 have to add to 180 and if angle 1 and 3 are equal and angle 2 equal 90, then angles 1 and 3 have to equal 45

Since the mirrors are parallel then angle 3 and 4 are alternate interior angles and equal (45)

Angle 5 equals 90, so angle 6 equals 45

6



Using the information on the diagram, which is true?

F $\overline{BD} \parallel \overline{EF}$

G $\overline{BD} \parallel \overline{DE}$

H $\overline{CB} \parallel \overline{BD}$

J $\overline{CB} \parallel \overline{DE}$

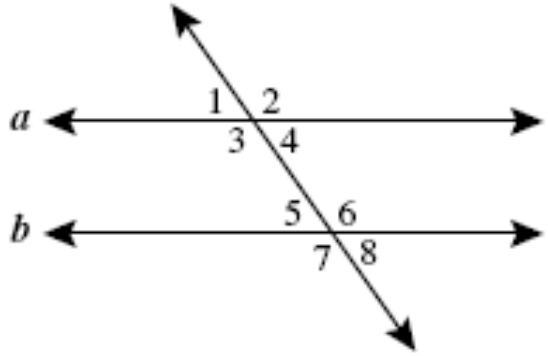
SSM:

- **parallel lines have all acute angles the same and all obtuse angles the same**

angles ABC and angle BED are corresponding and equal

so CB is parallel to DE

7



Line a is parallel to line b if —

A $m\angle 4 = m\angle 2$

B $m\angle 3 = m\angle 5$

C $m\angle 4 = m\angle 5$

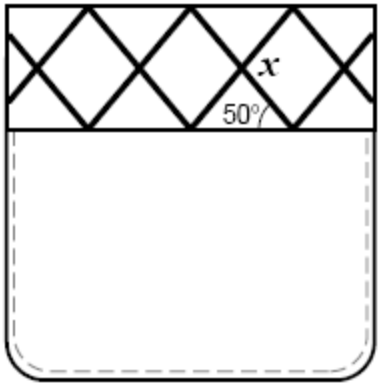
D $m\angle 3 = m\angle 2$

SSM:

- **have to involve both lines answers A and D do not**
- **have to look the same answer B does not work**

angles 4 and 5 are alternate interior angles and must be equal

1



A design made with parallel lines is sewn on a pocket of a shirt as shown. What is the value of x?

A 50°

B 80°

C 100°

D 130°

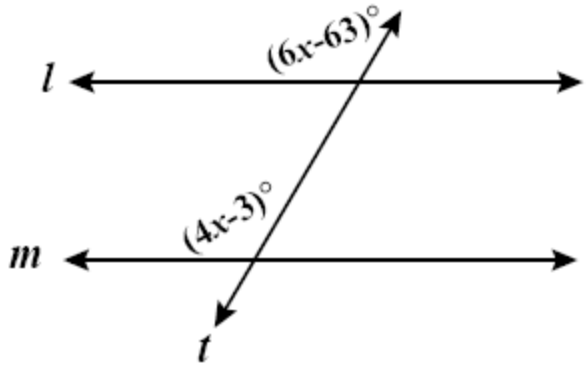
SSM:

- **angle x is obtuse eliminates A and B**

In parallel lines the acute angles and obtuse angles are always supplementary

So 180 – 50 = 130 = x

6



Line l is parallel to line m when the value of x is —

F 3
G 12
H 30
J 38

SSM:
- **angles are obtuse**
- **plug in answers to see which works**

Parallel lines → Angles are equal

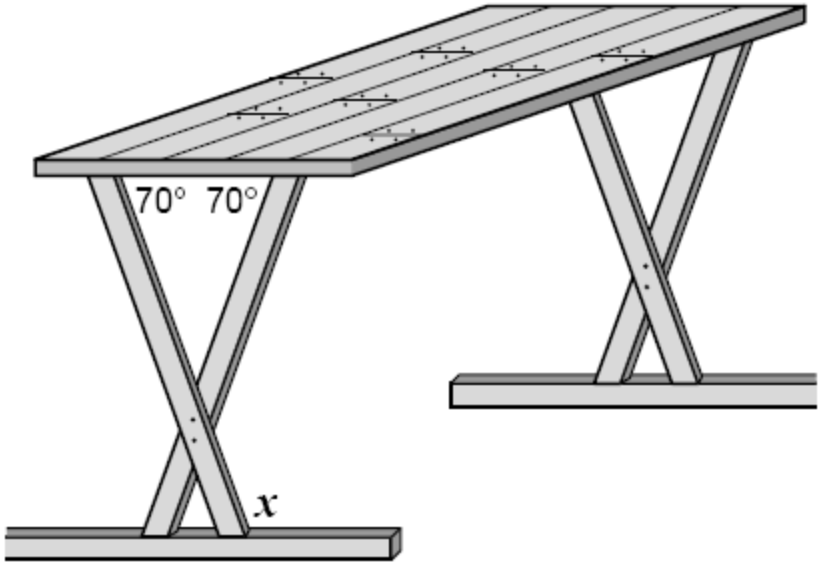
$6x - 63 = 4x - 3$

$6x = 4x + 60$

$2x = 60$

$x = 30$

7



The diagram shows a table being constructed. If the leg piece forms a 70° angle with the top of the table, what must be the value of x so that the top of the table is parallel to the floor?

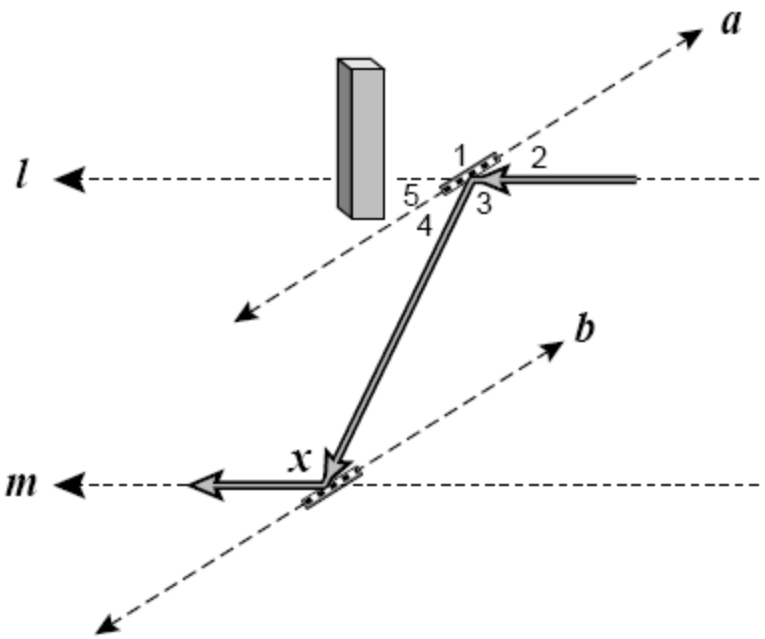
A 40°
B 70°
C 90°
D 110°

SSM:
- **angle x is obtuse**
  eliminates A , B and C

In parallel lines the acute angles and obtuse angles are always supplementary

So 180 – 70 = 110 = x

8 This drawing shows an apparatus designed to divert light rays around an obstacle.



Lines a and b are parallel and angles 2 and 4 each measure 32°. If lines l and m need to be parallel, what must be the value of x?

F 32°
G 64°
H 116°
J 148°

SSM:
- **angle x is obtuse eliminates F and G**

In parallel lines the obtuse angles (3 and x) are equal and angles 2, 3, and 4 form a line

So 180 – 2(32) = 180 – 64 = 116 = x

40 What is the slope of the line through $(-2, 3)$ and $(1, 1)$?

F $-\frac{3}{2}$

G $-\frac{2}{3}$

H $\frac{1}{2}$

J 2

SSM:

- **plot the points**

use slope formula

$$m = \frac{y_2 - y_1}{x_2 - x_1} = \frac{3 - 1}{-2 - 1} = \frac{2}{-3}$$