

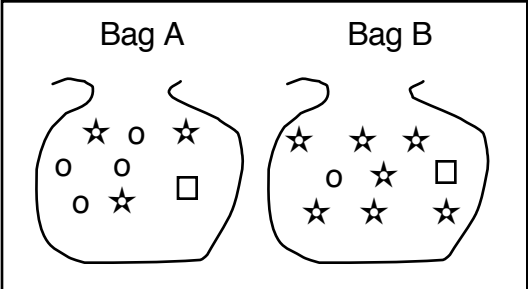
## High School Exit Program

### Lesson 85 [70]

#### EXERCISE 1 PROBABILITY

##### Textbook practice

- a. Open your textbook to lesson 85 and find part 1. ✓
- (Teacher reference:)



Bag B	objects	trials
$\frac{\star}{\text{all}}$	$\frac{7}{9}$	$= \frac{7}{9}$

- b. Last time, you learned about probability. The box shows bags. Some of the objects are stars.
- Bag A. Write the fraction of the objects that are stars. Remember, the number for all the objects is the denominator. ✓
- c. Everybody, what fraction of the objects are stars?  
(Signal.)  $3/8$ .  
Yes, there are 8 objects in the bag, and 3 of them are stars.

- You can use the fraction to figure out trials.  
Remember, for a trial, you select 1 object from the bag without looking. Then you return the object to the bag and shake the bag before taking the next trial. If you took trials that are based on the fraction  $\frac{3}{8}$ , how many trials would you take? (Signal.) 8.
- How many times would you expect to pull out a star? (Signal.) 3.  
Yes, about 3.
- (Repeat step c until firm.)

- d. Bag B. Write the fraction of the objects that are stars. ✓
- Everybody, what fraction of the objects are stars? (Signal.)  $\frac{7}{9}$ .
  - If you took trials that are based on that fraction, how many trials would you take? (Signal.) 9.
  - How many times would you expect to pull out a star? (Signal.) 7.
  - (Repeat step d until firm.)

- e. The next box shows the simple equation that you can write for objects and trials based on bag B.

- The simple equation is:  $7/9 = 7/9$ .
  - The first fraction tells about the objects. What does the first fraction tell about? (Signal.) *The objects*.
  - What does the second fraction tell about?  
(Signal.) *The trials*.
  - (Repeat step e until firm.)
- f. Yes, there are 9 objects in the bag, and 7 of them are stars. That means if you took 9 trials, you would expect to pull out a star on 7 of those trials.
- g. I'll say statements. You'll tell me if they tell about the number of objects in the bag or about the number of trials.
- A person took 7 trials and pulled out a star on 6 of those trials. Does that statement give numbers for the objects or numbers for the trials? (Signal.) *Trials*.
  - There were 7 objects in a bag. 6 of them were stars. Does that statement give numbers for the objects or numbers for the trials? (Signal.) *Objects*.

### Workbook practice

- a. Open your workbook to lesson 85 and find part 1. ✓
- b. For each statement, you'll write a fraction. If it tells about objects, you'll write it under **objects**. If it tells about trials, you'll write it under **trials**.
- c. Listen to statement A: A person took 15 trials and pulled out a star on 6 of those trials.

- Write that fraction where it goes. ✓
- Everybody, what's the fraction you wrote?  
(Signal.)  $6/15$ .
- Is that a fraction for the objects or for the trials?  
(Signal.) *Trials*.
- (Write on the board:)

	objects		trials
a.	$\frac{\star}{\text{all}}$	— =	$\frac{6}{15}$

- Here's what you should have.  $6/15$  is the fraction. It gives numbers for trials.
- d. Statement B: There are 3 stars in the bag, and a total of 9 objects in the bag.
- Write that fraction where it goes. ✓

- Everybody, what's the fraction? (Signal.)  $3/9$ .
- Does it give numbers for objects or trials?  
(Signal.) *Objects*.  
Yes, it's the fraction for objects.
- e. Write fractions for the rest of the statements in part 1.  
Pencils down when you're finished.  
(Observe students and give feedback.)
- f. Check your work.
- g. Statement C: Tom pulled 8 stars from the bag. He took a total of 11 trials.
  - What's the fraction? (Signal.)  $8/11$ .
  - Does it give numbers for objects or trials?  
(Signal.) *Trials*.  
Yes, it's the fraction for trials.
- h. Statement D: There were 8 objects in the bag. 1 of them was a star.
  - What's the fraction? (Signal.)  $1/8$ .

- Does it give numbers for objects or trials?  
(Signal.) *Objects*.
- i. Statement E: A person took 12 trials and pulled out a star 4 times.
- What's the fraction? (Signal.)  $4/12$ .
- Does it give numbers for objects or trials?  
(Signal.) *Trials*.

## High School Exit Program

### Lesson 85

#### EXERCISE 2 STRAIGHT LINE EQUATION

##### Plotting a Line through Zero

###### Textbook practice

- a. Find part 2 of your textbook. ✓
  - It shows how to make lines that go through zero on the coordinate system.
- b. There's an equation for a line that goes through zero:  
 $Y + 3 \text{ halves } X$ . The equation does not have a C term because the line goes through zero.
  - To make the line, you start at zero and plot a point based on the slope. That's:  $Y = 3$  and  $X = 2$ .
  - Touch that point on the coordinate system. ✓
  - Then you draw a line through that point and through zero. You can see the line and the point at 2 comma 3.

## Workbook practice

- a. Find part 2 of your workbook. ✓
  - You're going to make 4 lines on the coordinate system. Each equation tells about a different line.
- b. Everybody, read equation A. (Signal.)  $Y = 1 \text{ fifth } X$ .
  - Plot the point for  $X = 5$ ,  $Y = 1$ , and draw a line through that point and through zero. Write **A** and the coordinates next to the point. Pencils down when you're finished.  
(Observe students and give feedback.)
  - What are the coordinates of point A?  
(Signal.) *5 comma 1*.
- c. Work the rest of the items. Plot the point for each equation. Write the letter and the coordinates for each point. Then draw the line through zero.  
Pencils down when you're finished.  
(Observe students and give feedback.)
- d. Check your work.
  - What are the coordinates for point B?  
(Signal.) *7 comma 6*.
  - What are the coordinates for point C?

(Signal.) 3 comma – 5.

- What are the coordinates for point D?

(Signal.) 1 comma – 3.

- e. Find part K at the end of lesson 85 in your textbook.

That shows the lines you should have and the coordinates for each point you made. ✓

- Remember, if a line goes through zero, the equation does not have a C term.

Key:

((plunk in CS))

## High School Exit Program

### Lesson 85

#### EXERCISE 4 SIMULTANEOUS EQUATIONS

##### Textbook practice

- a. Find part 3 of your textbook. ✓
- Each pair of equations has 2 letters. You'll solve for both letters. Remember, each letter has the same value in both equations.
- b. Problem A:  $-2D + 5V = 51$  and  $3D - V = -18$ .
- Raise your hand when you know which equation you'll change by multiplying. ✓
  - Everybody, read the equation you'll change.  
(Signal.)  $3D - V = -18$ .
  - The equation has a D term and a V term. Which letter will you eliminate? (Signal.) V.
  - Raise your hand when you know what you multiply the second equation by. ✓
  - What do you multiply by? (Signal.) 5.
  - After you multiply, what will the V term be?  
(Signal.)  $-5V$ .

- Work the problem. Figure out what D equals. Then substitute for D and figure out what V equals. Pencils down when you're finished.  
(Observe students and give feedback.)
  - Check your work.
  - You multiplied the second equation by 5. Then you combined equations.
  - Read the combined equation. (Signal.)  $13D = -39$ .
  - What does D equal? (Signal.)  $-3$ .
  - You replaced D with  $-3$  in the first equation.
  - Everybody, what does V equal? (Signal.)  $9$ .
- c. Problem B:  $7 = R - 2P$ , and  $-19 = -3R + 5P$ .
- Raise your hand when you know which letter you'll eliminate. ✓
  - Which letter? (Signal.)  $R$ .
  - Work the problem. Figure out what P equals. Then substitute for P and figure out what R equals. Pencils down when you're finished.  
(Observe students and give feedback.)
  - Check your work.

- You multiplied the first equation by 3. Then you combined equations.
  - Read the combined equation. (Signal.)  $2 = -P$ .
  - What does P equal? (Signal.)  $-2$ .
  - You replaced P with  $-2$  in the second equation.
  - Everybody, what does R equal? (Signal.)  $3$ .
- d. Problem C is easy.
- Why is it easy? (Call on a student. Idea: *You can combine equations without multiplying.*)
  - Raise your hand when you know which letter you'll eliminate. ✓
  - Which letter? (Signal.)  $Y$ .
  - Work the problem. Figure out what X equals. Then substitute for X and figure out what Y equals. Pencils down when you're finished.  
(Observe students and give feedback.)
  - Check your work.
  - Read the combined equation. (Signal.)  $X = \text{zero}$ .
  - You replace X with zero in either equation.
  - Everybody, what does Y equal? (Signal.)  $10$ .

e. Problem D:  $6R - 2J = 20$ , and  $2R - 3J = 16$ .

- Raise your hand when you know which letter you'll eliminate. ✓
- Which letter? (Signal.)  $R$ .
- Work the problem. Figure out what  $J$  equals. Then substitute for  $J$  and figure out what  $R$  equals. Pencils down when you're finished.  
(Observe students and give feedback.)
- Check your work.
- You multiplied the second equation by  $-3$ .  
Then you combined equations.
- Read the combined equation. (Signal.)  $28 = -7J$ .
- What does  $J$  equal? (Signal.)  $-4$ .
- You replaced  $J$  with  $-4$  in the first equation.
- Everybody, what does  $R$  equal? (Signal.)  $2$ .

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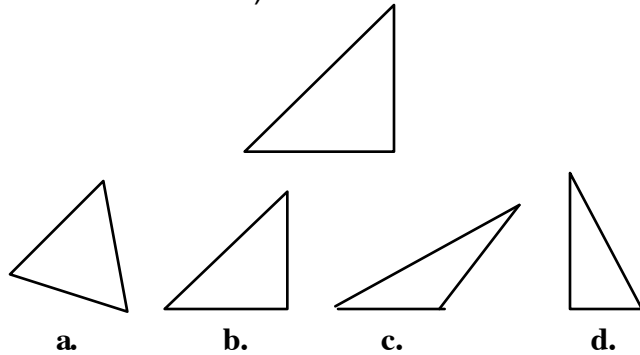
### Lesson 85

#### EXERCISE 4 SIMILAR TRIANGLES

##### Textbook practice

a. Find part 4. ✓

- (Teacher reference:)



b. The first triangle is larger than any of the triangles below it, but 1 of the triangles below it is **similar** to it.

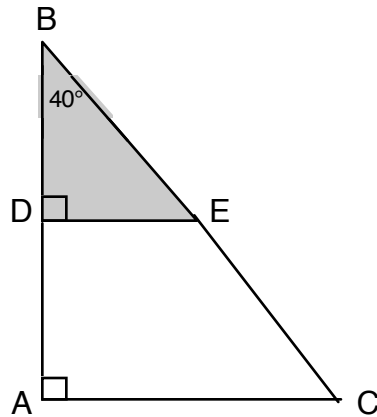
The triangle below is not the same size, but the angles are the same. The 2 triangles are the same shape.

- Touch the triangle that is the same shape as the larger triangle. ✓
- Which triangle are you touching? (Signal.) B.

Yes, the similar triangle is triangle B.

c. I'll read the rule about similar triangles:

- Similar triangles have same 3 angles, so they are the same shape, but not necessarily the same size.
- (Teacher reference:)



d. The next box shows 1 way to prove that triangles are if the 2 angles are the same.

- The smaller similar triangle is shaded. You can see that it fits inside the larger triangle.
- We know that each triangle has 2 angles that are the same, so each triangle must have a **third** angle that is the same.

e. Touch angle B. ✓

- That's an angle for both the larger triangle and the smaller triangle.
- You know the number of degrees in that angle.  
How many degrees? (Signal.) 40.
- So both triangles have a 40-degree angle.
- f. Touch angle D. ✓
- How many degrees is that angle? (Signal.) 90.
- g. Touch angle A. ✓
- How many degrees is that angle? (Signal.) 90.
- So both triangles have a 90-degree angle.
- h. Touch angle E. ✓
- For the shaded triangle, we have a 40° angle and a 90° angle.
- Raise your hand when you know the degrees in angle E. ✓
- How many degrees in angle E? (Signal.) 50.
- i. Touch angle C. ✓
- For the larger triangle, we have a 40° angle and a 90° angle.
- So how many degrees are in angle C? (Signal.) 50.

- j. The triangles are the same shape because the 3 angles in the smaller triangle are the same as the 3 angles in the larger triangle.
- k. Remember, similar triangles have the same 3 angles.
- If you know that the triangles have 2 angles that are the same, you know that the third angle is the same.
  - So the triangles are similar.

**Textbook practice**

- a. Find part 5. ✓
- b. Each item shows 2 triangles.
- Some pairs of triangles are similar and some are not. 2 angles are shown in each triangle. You'll figure out the missing angle. Remember, if 2 angles are the same, the third angle is the same.
- c. Item A. The angles given for the smaller triangle are  $90^\circ$  and  $42^\circ$ .
- The angles given for the larger triangle are  $42^\circ$  and  $48^\circ$ .
  - One angle is the same for both triangles. So if you figure out the missing angle in **either** triangle, you'll know if they are similar.

- Raise your hand when you know the missing angle in the larger triangle. ✓
  - What's the missing angle? (Signal.)  $90^\circ$ .  
Yes,  $90^\circ$ .
  - We know all 3 angles for the larger triangle. We know that the smaller triangle has 2 of them,  $42^\circ$  and  $90^\circ$ .  
So the missing angle in the smaller triangle **must** be  $48^\circ$ .
  - Figure out the missing angle in the smaller triangle and see if it's  $48^\circ$ . ✓
  - Everybody, is the third angle  $48^\circ$ ? (Signal.) Yes.
  - So are the triangles similar? (Signal.) Yes.
- d. Item B. Figure out if the triangles are similar. Start with the smaller triangle. Check your work with the larger triangle. Pencils down when you're finished.  
(Observe students and give feedback.)
- Everybody, what's the missing angle in the smaller triangle? (Signal.)  $30^\circ$ .
  - What's the missing angle in the larger triangle?  
(Signal.)  $40^\circ$ .
  - Are the triangles similar? (Signal.) Yes.

e. Item C. Figure out if the triangles are similar. Start with the larger triangle. Check your work with the smaller triangle. Pencils down when you're finished.

(Observe students and give feedback.)

- Everybody, what's the missing angle in the larger triangle? (Signal.)  $50^\circ$ .
- What's the missing angle in the smaller triangle? (Signal.)  $70^\circ$ .
- Are the triangles similar? (Signal.) *No*.

f. Item D. Figure out if the triangles are similar. Start with the larger triangle. Check your work with the smaller triangle. Pencils down when you're finished.

(Observe students and give feedback.)

- Everybody, what's the missing angle in the larger triangle? (Signal.)  $35^\circ$ .
- What's the missing angle in the smaller triangle? (Signal.)  $120^\circ$ .
- Are the triangles similar? (Signal.) *Yes*.

g. Remember, if 2 angles are the same, then all 3 angles are the same and the triangles are similar.

They are exactly the same shape.

## High School Exit Program

### Lesson 85

#### EXERCISE 5 ALGEBRA TRANSLATION

#### Equations and Inequalities

##### Textbook practice

- a. Find part 6. ✓
- For each item, you'll write an equation or an inequality.
- b. Item A: 3 times a number is greater than the number minus 2.
- Write the equation or inequality for that statement, then stop. Use the letter N for the term.  
(Observe students and give feedback.)
  - Check your work.
  - (Write on the board:)

a.  $3n > n - 2$

- Here's what you should have:  $3N > N - 2$ .  
Skip 4 lines.
- c. Item B: 2 times a number is 10 less than 4 times that number.

- Write the equation or inequality for that statement.

Stop when you'd done that much. ✓

- (Write on the board:)

**b.**  $2n = 4n - 10$

- Here's what you should have:  $2N = 4N - 10$ .

Skip 4 lines.

- d. item C: 6 less than a number is greater than 2 times the number.

- Write the equation or inequality for that statement.

Stop when you'd done that much. ✓

- (Write on the board:)

**c.**  $n - 6 > 2n$

- Here's what you should have:  $N - 6 > 2N$ .

Skip 4 lines.

- e. Item D: 2 less than 3 times a number is 4 greater than 48.

- Write the equation or inequality for that statement.

Stop when you'd done that much. ✓

- (Write on the board:)

**d.**  $3n - 2 = 48 + 4$

- Here's what you should have:  $3N - 2 = 48 + 4$ .
- f. Work all the problems in part 6. Pencils down when you're finished.  
(Observe students and give feedback.)
- g. Check your work.  
For each item, start with  $N$  and say the equation or inequality.
  - Item A. (Signal.)  $N > -1$ .
  - Item B. (Signal.)  $N = 5$ .
  - Item C. (Signal.)  $N < -6$ .
  - Item D. (Signal.)  $N = 18$ .

## EXERCISE 6 INDEPENDENT WORK

Assign Independent Work:  
textbook parts 7–15 and workbook part 3.