

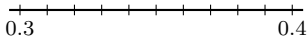
Inequalities: Starters

nierówność

Starter 1: Inequality Symbols (1 of 3)

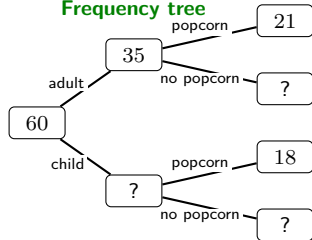
oś liczbowa

Number line A



drzewko częstości

Frequency tree



1. Write $\frac{3}{8}$ as a
ułamek dziesiętny
decimal
procent
and as a percentage.

2. Write 32 000 in
notacja naukowa
standard form .

oś liczbowa

3. Mark 32%, 0.35 and $\frac{3}{8}$ on number line A. Write
them in order, using <.

Starter 1: Inequality Symbols (1 of 3)

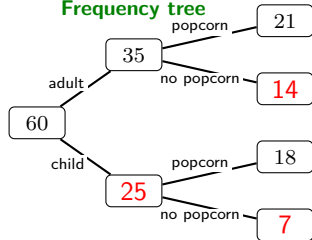
oś liczbowa

Number line A

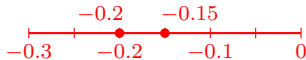


drzewko częstości

Frequency tree



Q8



1. Write $\frac{3}{8}$ as a
ułamek dziesiętny
decimal
procent
and as a percentage.

$$0.375 = 37.5\%$$

2. Write 32 000 in
notacja naukowa
standard form .

$$3.2 \times 10^4$$

oś liczbowa

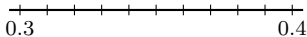
3. Mark 32%, 0.35 and $\frac{3}{8}$ on number line A. Write
them in order, using $<$. $32\% < 0.35 < \frac{3}{8}$

nierówność

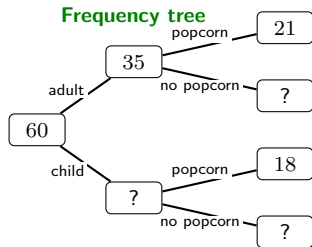
Starter 1: Inequality Symbols (2 of 3)

oś liczbowa

Number line A



drzewko częstości



4. Write $<$ or $>$.

$$3.2 \times 10^4 \text{ ___ } 9.8 \times 10^3$$

$$6 \times 10^{-3} \text{ ___ } 2 \times 10^{-2}$$

5. 60 people watched a

film. Complete the
drzewko częstości

frequency tree .

losowo

6. An adult is chosen at random. Find the
prawdopodobieństwo

probability

procent

that they bought

popcorn, as a percentage. Do the same for a child.

Write $<$ or $>$ between them.

Starter 1: Inequality Symbols (2 of 3)

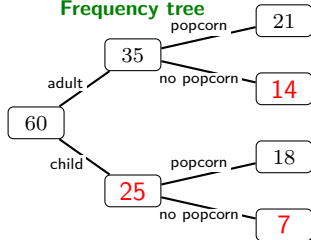
oś liczbowa

Number line A

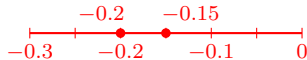


drzewko częstości

Frequency tree



Q8

4. Write $<$ or $>$.

$$3.2 \times 10^4 > 9.8 \times 10^3$$

$$6 \times 10^{-3} < 2 \times 10^{-2}$$

5. 60 people watched a

film. Complete the
drzewko częstości

frequency tree .

losowo

6. An adult is chosen at random. Find the
prawdopodobieństwo

probability

procent

that they bought

popcorn, as a percentage. Do the same for a child.

Write $<$ or $>$ between them. $\frac{21}{35} = 60\%$ and

$$\frac{18}{25} = 72\%, \text{ so } 60\% < 72\%$$

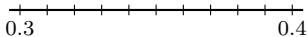
nierówność

Starter 1: Inequality Symbols (3 of 3)

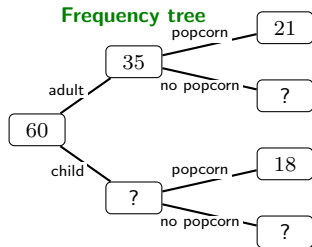
7. $x > 0.3$ means "x is greater than 0.3". Which of

oś liczbowa

Number line A



drzewko częstości



these could x be?

$$\frac{2}{5} \quad 0.29 \quad 3 \times 10^{-1} \quad 31\% \quad \frac{1}{4}$$

8. (Challenge) $0.2 > 0.15$. Is $-0.2 > -0.15$? Explain

oś liczbowa

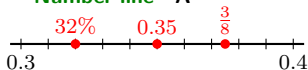
using a number line .

Starter 1: Inequality Symbols (3 of 3)

7. $x > 0.3$ means "x is greater than 0.3". Which of

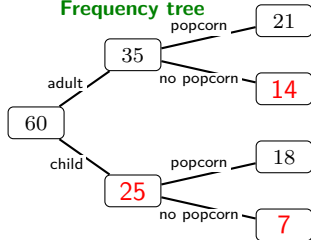
oś liczbowa

Number line A

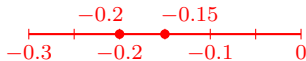


drzewko częstości

Frequency tree



Q8



these could x be?

$$\frac{2}{5} \quad 0.29 \quad 3 \times 10^{-1} \quad 31\% \quad \frac{1}{4}$$

$\frac{2}{5}$ and 31%, but not $3 \times 10^{-1} = 0.3$

8. (Challenge) $0.2 > 0.15$. Is $-0.2 > -0.15$? Explain

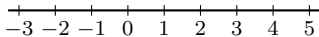
oś liczbowa

using a number line . No: $-0.2 < -0.15$

Starter 2: Inequalities on a Number Line (1 of 3)

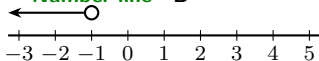
oś liczbowa

Number line A



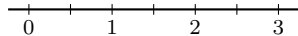
oś liczbowa

Number line B



oś liczbowa

Number line C



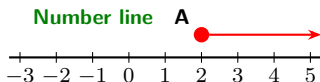
1. Write 0.45 as a
ułamek
fraction and as a
procent
percentage.

2. Write 6.1×10^{-3} as an
liczba w zwykłej post
ordinary number

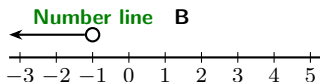
3. Draw $x \geq 2$ on oś liczbowa
number line A. Can x be equal
to 2?

Starter 2: Inequalities on a Number Line (1 of 3)

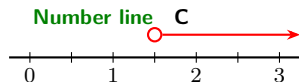
oś liczbowa



oś liczbowa



oś liczbowa



1. Write 0.45 as a
ułamek
fraction and as a
procent
percentage.

$$\frac{9}{20} = 45\%$$

2. Write 6.1×10^{-3} as an
liczba w zwykłej post
ordinary number

$$0.0061$$

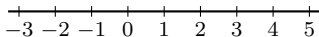
oś liczbowa

3. Draw $x \geq 2$ on number line A. Can x be equal
to 2? Yes: $\geq$ includes 2, so the circle is filled.

Starter 2: Inequalities on a Number Line (2 of 3)

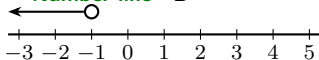
oś liczbowa

Number line A



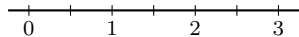
oś liczbowa

Number line B



oś liczbowa

Number line C



4. Write the inequality on number line B, and two integers that satisfy it.

5. Draw $y > \frac{3}{2}$ on number line C. Does $y = 150\%$ satisfy it?

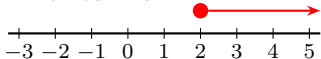
6. Which of these satisfy $n > 4 \times 10^3$?

4000 3.9×10^4 0.5×10^4 4.01×10^3

Starter 2: Inequalities on a Number Line (2 of 3)

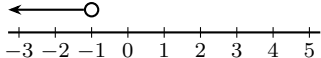
oś liczbowa

Number line A



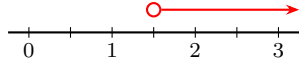
oś liczbowa

Number line B



oś liczbowa

Number line C



4. Write the inequality on number line B, and two integers that satisfy it.

$x < -1$; for example -2 and -3

5. Draw $y > \frac{3}{2}$ on number line C. Does $y = 150\%$ satisfy it? No: $150\% = \frac{3}{2}$, not more than $\frac{3}{2}$.

6. Which of these satisfy $n > 4 \times 10^3$?

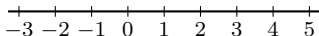
4000 3.9×10^4 0.5×10^4 4.01×10^3

All except 4000, which equals 4×10^3

Starter 2: Inequalities on a Number Line (3 of 3)

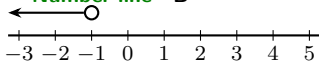
oś liczbowa

Number line A



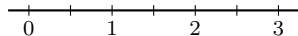
oś liczbowa

Number line B



oś liczbowa

Number line C



7. A match ends in a win, a draw or a loss.

$P(\text{win}) = 0.35$ and $P(\text{draw}) = \frac{1}{5}$. Find $P(\text{loss})$ as percent

a percentage. Write $<$ or $>$ between $P(\text{win})$ and

$P(\text{loss})$.

liczba całkowita

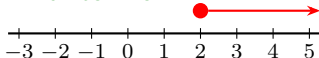
8. (Challenge) x is an integer, $x > -3$

and $x \leq 2$. List the values x can take.

Starter 2: Inequalities on a Number Line (3 of 3)

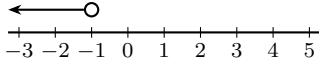
oś liczbowa

Number line A



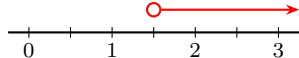
oś liczbowa

Number line B



oś liczbowa

Number line C



7. A match ends in a win, a draw or a loss.

$P(\text{win}) = 0.35$ and $P(\text{draw}) = \frac{1}{5}$. Find $P(\text{loss})$ as percent

a percentage. Write $<$ or $>$ between $P(\text{win})$ and

$P(\text{loss})$. 45%, so $P(\text{win}) < P(\text{loss})$
liczba całkowita

8. (Challenge) x is an integer, $x > -3$

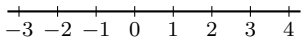
and $x \leq 2$. List the values x can take.

-2, -1, 0, 1, 2

Starter 3: nierówność podwójna Double Inequalities (1 of 3)

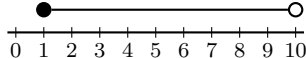
oś liczbowa

Number line A



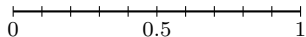
oś liczbowa

Number line B



oś liczbowa

Number line C



1. Write $\frac{7}{20}$ as a
ułamek dziesiętny
decimal
procent
and as a percentage.

2. Work out

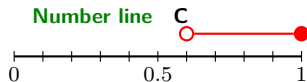
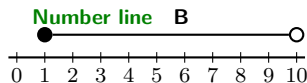
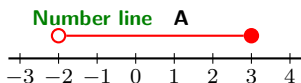
$$(3 \times 10^4) \times (2 \times 10^3).$$

oś liczbowa

3. Draw $-2 < x \leq 3$ on
liczba całkowita
integers
number line
spełniać
A. List the
that satisfy it.

Starter 3: nierówność podwójna Double Inequalities (1 of 3)

oś liczbowa



1. Write $\frac{7}{20}$ as a
ułamek dziesiętny
decimal
procent
and as a percentage.

$$0.35 = 35\%$$

2. Work out

$$(3 \times 10^4) \times (2 \times 10^3).$$

$$6 \times 10^7$$

3. Draw $-2 < x \leq 3$ on
oś liczbowa
number line
liczba całkowita
spełniać
integers
that satisfy
it.

$$-1, 0, 1, 2, 3$$

Starter 3: Double Inequalities (2 of 3)

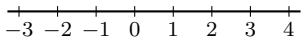
nierówność podwójna

notacja naukowa

oś liczbowa

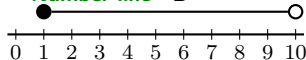
oś liczbowa

Number line A



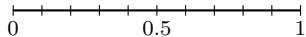
oś liczbowa

Number line B



oś liczbowa

Number line C



4. Standard form is $A \times 10^n$. Number line B

shows the values A can take. Write them as a
nierówność podwójna

double inequality

notacja naukowa

5. Which of these are in standard form ?

$$0.8 \times 10^3 \quad 10 \times 10^2 \quad 1 \times 10^5 \quad 9.9 \times 10^{-4}$$

ułamek dziesiętny

6. Write $\frac{1}{4} < x < 40\%$ using decimals

spełniać

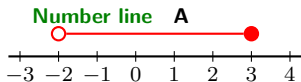
Does $x = \frac{1}{3}$ satisfy it?

Starter 3: nierówność podwójna (2 of 3)

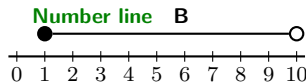
notacja naukowa

oś liczbowa

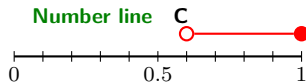
oś liczbowa



oś liczbowa



oś liczbowa



4. Standard form is $A \times 10^n$. Number line B

shows the values A can take. Write them as a nierówność podwójna

double inequality . $1 \leq A < 10$

notacja naukowa

5. Which of these are in standard form ?

0.8×10^3 10×10^2 1×10^5 9.9×10^{-4}

1×10^5 and 9.9×10^{-4} . 0.8 is less than 1, and 10 is not less than 10.

ułamek dziesiętny

6. Write $\frac{1}{4} < x < 40\%$ using decimals .
spełniać

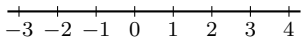
Does $x = \frac{1}{3}$ satisfy it? $0.25 < x < 0.4$; yes,

$\frac{1}{3} = 0.\dot{3}$

Starter 3: Double Inequalities (3 of 3)

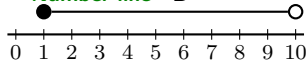
oś liczbowa

Number line A



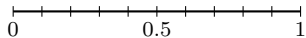
oś liczbowa

Number line B



oś liczbowa

Number line C



prawdopodobieństwo spełniać

7. Every probability p satisfies
prawdopodobieństwo

$0 \leq p \leq 1$. The probability of rain

tomorrow is more than 60%. Show the values p

oś liczbowa

can take on number line C, and write them as a

nierówność podwójna

double inequality

8. (Challenge) $0.6 < P(\text{rain}) \leq 1$. Write a

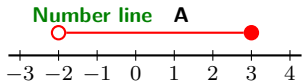
nierówność podwójna

double inequality

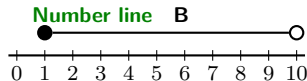
for $P(\text{no rain})$.

Starter 3: Double Inequalities (3 of 3)

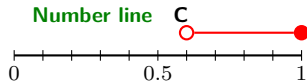
oś liczbowa



oś liczbowa



oś liczbowa



prawdopodobieństwo spełniać

7. Every probability p satisfies
prawdopodobieństwo

$0 \leq p \leq 1$. The probability of rain

tomorrow is more than 60%. Show the values p

oś liczbowa

can take on number line C, and write them as a

nierówność podwójna

double inequality . $0.6 < p \leq 1$

8. (Challenge) $0.6 < P(\text{rain}) \leq 1$. Write a

nierówność podwójna

double inequality for $P(\text{no rain})$.

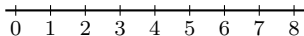
$$0 \leq P(\text{no rain}) < 0.4$$

rozwiązać nierówność

Starter 4: Solving Inequalities (1 of 3)

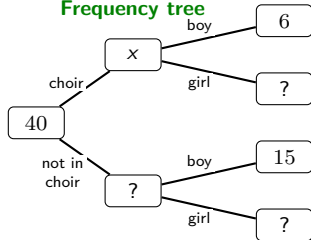
oś liczbowa

Number line A



drzewko częstości

Frequency tree



1. Write 12% as a
ułamek dziesiętny

decimal
ułamek

and as a fraction in

its
najprostsza postać
simplest form .

rozwiązać

3. Solve $11 > 2x + 3$. Show the solution on
oś liczbowa
number line A.

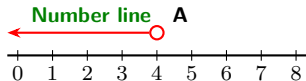
2. Work out

$$(8 \times 10^6) \div (2 \times 10^2).$$

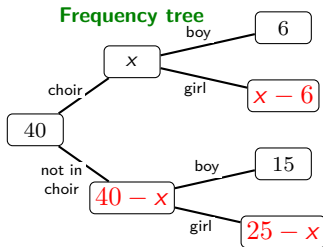
rozwiązać nierówność

Starter 4: Solving Inequalities (1 of 3)

oś liczbowa



drzewko częstości



1. Write 12% as a
ułamek dziesiętny

decimal
ułamek

and as a fraction in

2. Work out

$$(8 \times 10^6) \div (2 \times 10^2).$$

$$4 \times 10^4$$

its
najprostsza postać
simplest form .

$$0.12 = \frac{3}{25}$$

rozwiązać

3. Solve $11 > 2x + 3$. Show the solution on
oś liczbowa

number line A. $8 > 2x$, so $4 > x$, which is

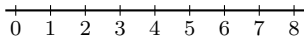
$$x < 4$$

rozwiązać nierówność

Starter 4: Solving Inequalities (2 of 3)

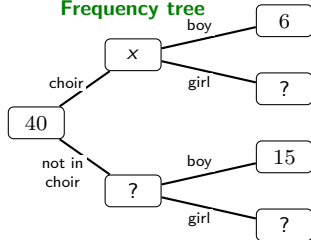
oś liczbowa

Number line A



drzewko częstości

Frequency tree



4. 30% of y is less than

6. Write an
nierówność

inequality and
rozwiązać
solve it.

rozwiązać

5. Solve

$$3m \leq 1.2 \times 10^5,$$

giving m in
notacja naukowa
standard form .

6. 40 pupils were asked if they sing in the choir.

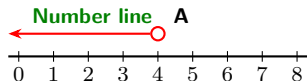
drzewko częstości

Complete the frequency tree in terms of x .

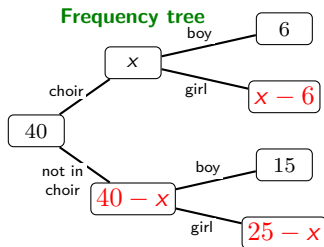
rozwiązać nierówność

Starter 4: Solving Inequalities (2 of 3)

oś liczbowa



drzewko częstości



4. 30% of y is less than

6. Write an
nierówność
inequality and
rozwiązać
solve it.

$$0.3y < 6, \text{ so } y < 20$$

6. 40 pupils were asked if they sing in the choir.

drzewko częstości

Complete the frequency tree in terms of x .

rozwiązać

5. Solve

$$3m \leq 1.2 \times 10^5,$$

giving m in
notacja naukowa
standard form .

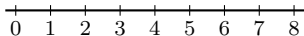
$$m \leq 4 \times 10^4$$

rozwiązać nierówność

Starter 4: Solving Inequalities (3 of 3)

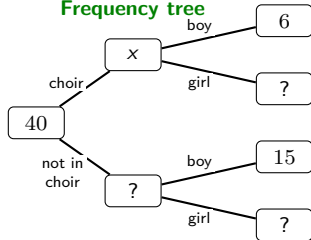
oś liczbowa

Number line A



drzewko częstości

Frequency tree



7. There are more girls than boys in the choir. Write

nierówność

rozwiązać

an inequality in x and solve it.

prawdopodobieństwo

8. (Challenge) The probability that a

losowo

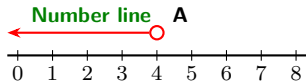
pupil chosen at random is in the choir is also less

than 0.4. List the values x can take.

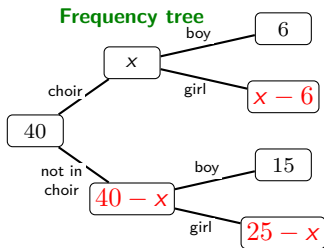
rozwiązać nierówność

Starter 4: Solving Inequalities (3 of 3)

oś liczbowa



drzewko częstości



7. There are more girls than boys in the choir. Write an inequality in x and solve it.

$$x - 6 > 6, \text{ so } x > 12$$

prawdopodobieństwo

8. (Challenge) The probability that a pupil chosen at random is in the choir is also less than 0.4. List the values x can take.

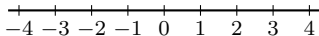
$$0.4 \times 40 = 16, \text{ so } 12 < x < 16: \quad x = 13, 14 \text{ or } 15$$

rozwiązać nierówność podwójną

Starter 5: Solving Double Inequalities (1 of 3)

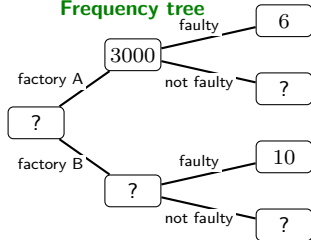
oś liczbowa

Number line A



drzewko częstości

Frequency tree



1. Write $\frac{1}{8}$ as a
ułamek dziesiętny

decimal

procent

and as a percentage.

2. Write 0.0032 in
notacja naukowa

standard form

rozwiązać

3. Solve

$$5x - 3 \leq 2x + 9.$$

4. A company made

$$5 \times 10^3 \text{ phones.}$$

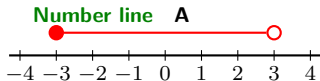
Complete the
drzewko częstości

frequency tree

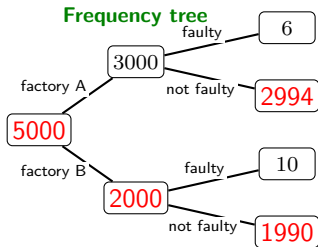
rozwiązać nierówność podwójną

Starter 5: Solving Double Inequalities (1 of 3)

oś liczbowa



drzewko częstości



1. Write $\frac{1}{8}$ as a
ułamek dziesiętny
decimal
procent
and as a percentage.

$$0.125 = 12.5\%$$

rozwiązać

3. Solve
- $$5x - 3 \leq 2x + 9.$$
- $$3x \leq 12, \text{ so } x \leq 4$$

2. Write 0.0032 in
notacja naukowa
standard form

$$3.2 \times 10^{-3}$$

4. A company made

$$5 \times 10^3 \text{ phones.}$$

Complete the
drzewko częstości
frequency tree

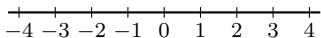
rozwiązać nierówność podwójną

Starter 5: Solving Double Inequalities (2 of 3)

prawdopodobieństwo

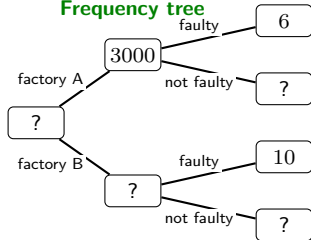
oś liczbowa

Number line A



drzewko częstości

Frequency tree



4. Write the probability that a phone from factory A is faulty in standard form .

Do the same for factory B. Write $<$ or $>$ between them.

rozwiązać

5. Solve $-5 \leq 2x + 1 < 7$. Show it on number line A, and list the integers

that satisfy it.

obciążony

6. A biased spinner lands on red with probability

probability

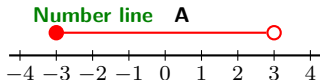
$2x - 0.4$. Use

rozwiązać nierówność podwójną

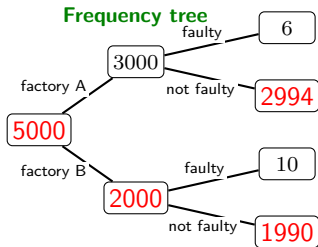
Starter 5: Solving Double Inequalities (2 of 3)

prawdopodobieństwo

oś liczbowa



drzewko częstości



4. Write the probability that a phone from factory A is faulty in standard form .

Do the same for factory B. Write $<$ or $>$ between

them. $\frac{6}{3000} = 2 \times 10^{-3} < \frac{10}{2000} = 5 \times 10^{-3}$

rozwiązać

5. Solve $-5 \leq 2x + 1 < 7$. Show it on number line A, and list the integers

spełniać

that satisfy it. $-3 \leq x < 3$;

$-3, -2, -1, 0, 1, 2$

obciążony

6. A biased spinner lands on red with probability

2x - 0.4. Use

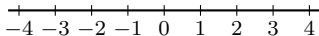
rozwiązać nierówność podwójną

Starter 5: Solving Double Inequalities (3 of 3)

7. (Challenge) A bag holds 4 red and n blue

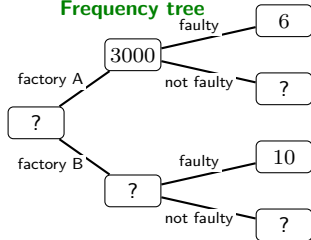
oś liczbowa

Number line A



drzewko częstości

Frequency tree



counters. $P(\text{red}) < 20\%$. Find the smallest value

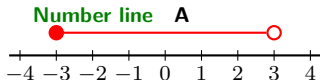
n can take.

rozwiązać nierówność podwójną

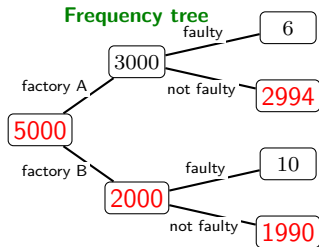
Starter 5: Solving Double Inequalities (3 of 3)

7. (Challenge) A bag holds 4 red and n blue

oś liczbowa



drzewko częstości



counters. $P(\text{red}) < 20\%$. Find the smallest value

n can take. $0.2(4 + n) > 4$, so $4 + n > 20$ and

$$n > 16; \quad n = 17$$