Anchor Set
A1 – A10

With Annotations
Prompt

Two rival companies began the same year. The equations below model the number of employees, $y$, at these companies $x$ years after the companies began.

Company R: $y = 3x + 24$

Company T: $y = 4x + 10$

Company R stated, “We have 42 employees, the same number of employees as company T has this year.” Determine if company R’s claim is possible. Explain your reasoning.

Company T stated, “After 15 years, we will have the same number of employees as company R.” Determine if company T’s claim is possible. Explain your reasoning.

Enter your answers and your explanations in the space provided.

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| 4     | Student response includes the following 5 elements.  
- **Reasoning component** = 1 element  
  o Student states that neither claim is possible.  
- **Reasoning component** = 1 element  
  o Partial explanation for why company R’s claim is impossible.  
- **Reasoning component** = 1 element  
  o Complete explanation for why company R’s claim is impossible (Note, the complete explanation states the number of years for each company to have 42 employees or states the number of years in the correct solution). A student receiving credit for a complete explanation for why company R’s claim is impossible will also receive credit for a partial explanation.  
- **Reasoning component** = 1 element  
  o Partial explanation for why company T’s claim is impossible.  
- **Reasoning component** = 1 element  
  o Complete explanation for why company T’s claim is impossible (Note, the complete explanation states the number of employees for each company in year 15 or states the number of employees in the correct solution). A student receiving credit for a complete explanation for why company T’s claim is impossible will also receive credit for a partial explanation.  
Sample Student Response:  
Neither company’s claim is possible.  
Company R’s claim is not possible because the number of years is not equal for 42 employees. Company R has 42 employees after 6 years and company T has 42 employees after 8 years.  
Company T’s claim is not possible because company R has 69 employees after 15 years and company T has 70 employees after 15 years.  
Or other valid reasoning.  
Student response includes all 5 of the above elements. |
| 3     | Student response includes 4 of the above elements. |
| 2     | Student response includes 3 of the above elements. |
| 1     | Student response includes 1-2 of the above elements. |
Two rival companies began the same year. The equations below model the number of employees, \( y \), at these companies \( x \) years after the companies began.

Company R: \( y = 3x + 24 \)

Company T: \( y = 4x + 10 \)

Company R stated, "We have 42 employees, the same number of employees as company T has this year." Determine if company R's claim is possible. Explain your reasoning.

Company T stated, "After 15 years, we will have the same number of employees as company R." Determine if company T's claim is possible. Explain your reasoning.

\[
\begin{align*}
42 &= 3x + 24 \\
-24 &= -24 \\
18 &= 3x \\
x &= 6 \text{ years} \\
42 &= 4x + 10 \\
-10 &= -10 \\
32 &= 4x \\
x &= 8 \text{ years} \\
\end{align*}
\]

Company R's claim is impossible because after I did the math, company T will have 42 employees in about 2 more years.

\[
\begin{align*}
y &= 4(15) + 10 \\
y &= 60 + 10 \\
y &= 70 \text{ employees for company T after 15 years} \\

y &= 3(15) + 24 \\
y &= 45 + 24 \\
y &= 69 \text{ employees for company R after 15 years} \\
\end{align*}
\]

Company T's claim is theoretically impossible suggesting that the rate of new employees being hired stays the same.
This response receives full credit. The response includes each of the five required elements:

- The response indicates that neither claim is possible (Company r’s claim is impossible) and (company t’s claim is theoretically impossible).

- The response provides a complete explanation for why Company R’s claim is impossible ($42 = 3x + 24; x=6$ years; $42 = 4x + 10; x = 8$ years) and (company t will have 42 employees in about 2 more years.)

A complete explanation for why company R’s claim is impossible includes a partial explanation and receives credit for two elements.

- The response provides a complete explanation for why Company T’s claim is impossible ($y = 4(15) + 10; y = 70$ employees for company t after 15 years; $y = 3(15) + 24; y = 69$ employees for company r after 15 years)

A complete explanation for why company T’s claim is impossible includes a partial explanation and receives credit for two elements.
Two rival companies began the same year. The equations below model the number of employees, \( y \), at these companies \( x \) years after the companies began.

Company R: \( y = 3x + 24 \)

Company T: \( y = 4x + 10 \)

Company R stated, “We have 42 employees, the same number of employees as company T has this year.” Determine if company R’s claim is possible. Explain your reasoning.

Company T stated, “After 15 years, we will have the same number of employees as company R.” Determine if company T’s claim is possible. Explain your reasoning.

Company R's statement is not possible because in order for company T to have 42 employees it will take 8 years and for company R to have 42 employees it will take only 6

\[
3(6) + 24 = 42 \\
4(8) + 10 = 42
\]

No company T's claim isn't possible because

\[
4(15) + 10 = 70 \quad \text{and} \quad 3(15) + 24 = 69
\]
This response receives full credit. The response includes each of the five required elements:

- The response indicates that neither claim is possible (Company R’s statement is not possible) and (company T’s claim isn’t possible).

- The response provides a complete explanation for why Company R’s claim is impossible (in order for company T to have 42 employees it will take 8 years and for company R to have 42 employees it will take only 6).

- The response provides a complete explanation for why Company T’s claim is impossible (4(15) + 10 = 70 and 3(15) + 24 = 69).

Complete explanations can be either in words or demonstrated with equations/work. The work shown for why company T’s claim is impossible clearly shows that after 15 years company R will have 69 employees and company T will have 70 employees.
Two rival companies began the same year. The equations below model the number of employees, $y$, at these companies $x$ years after the companies began.

Company R: $y = 3x + 24$

Company T: $y = 4x + 10$

Company R stated, 'We have 42 employees, the same number of employees as company T has this year.' Determine if company R’s claim is possible. Explain your reasoning.

Company T stated, "After 15 years, we will have the same number of employees as company R." Determine if company T’s claim is possible. Explain your reasoning.

Company R statement is not true. Based on that statement, after 6 years of business, company R will have 42 workers. After 8 years of business, company T will have 42 workers. They will not have 72 workers in the same year. In company T statement, it is not correct either. After 15 years, company T will have 70 workers and company R will have 119 workers.
This response receives partial credit. The response includes four of the five required elements:

- The response indicates that neither claim is possible (Company R statement is not true) and (In company T statement, it is not correct either).

- The response provides a complete explanation for why Company R’s claim is impossible (after 6 years of business, company R will have 42 workers. After 8 years of business, company T will have 42 employees).

- The response provides a partial explanation for why Company T’s claim is impossible (After 15 years company T will have 70 workers and company R will have 119 workers).

The explanation is partial because it shows the correct number of workers for company T after 15 years (70). The number of employees for company R after 15 years (119) is incorrect. A complete explanation would show the correct number of employees for both companies after 15 years.
Two rival companies began the same year. The equations below model the number of employees, $y$, at these companies $x$ years after the companies began.

Company R: $y = 3x + 24$

Company T: $y = 4x + 10$

Company R stated, “We have 42 employees, the same number of employees as company T has this year.” Determine if company R’s claim is possible. Explain your reasoning.

Company T stated, “After 15 years, we will have the same number of employees as company R.” Determine if company T’s claim is possible. Explain your reasoning.

No, Company R claim is impossible because if $x = 6$ and you plug that into Company T's formula you dont get 42.

No, Company T's claim is impossible because after 15 years, company r will only have 69 employees and company t will have 70.
This response receives partial credit. The response includes four of the five required elements:

- The response indicates that neither claim is possible (Company R claim is impossible) and (Company T’s claim is impossible).

- The response provides a partial explanation for why Company R’s claim is impossible (if x=6 and you plug that into company T’s formula you don’t get 42)

The explanation is partial because it shows the correct number of years (6) for when company R has 42 employees. A complete explanation would also show either the correct number of years when company T would have 42 employees (8) or the correct number of employees company T would have after 6 years (34).

- The response provides a complete explanation for why Company T’s claim is impossible (After 15 years, company r will only have 69 employees and company t will have 70).
Two rival companies began the same year. The equations below model the number of employees, $y$, at these companies $x$ years after the companies began.

Company R: $y = 3x + 24$

Company T: $y = 4x + 10$

Company R stated, "We have 42 employees, the same number of employees as company T has this year." Determine if company R’s claim is possible. Explain your reasoning.

Company T stated, "After 15 years, we will have the same number of employees as company R." Determine if company T’s claim is possible. Explain your reasoning.

**Neither claim is possible. If these companies have been around for fifteen years, company R would have 69 employees and company T would have 70 employees.**
This response receives partial credit. The response includes three of the five required elements:

- The response indicates that neither claim is possible (Neither claim is possible).
- The response provides a complete explanation for why Company T’s claim is impossible (If these companies have been around for fifteen years, company R would have 69 employees and company T would have 70 employees).

The explanation for why Company R’s claim is impossible is missing.
Two rival companies began the same year. The equations below model the number of employees, $y$, at these companies $x$ years after the companies began.

Company R: $y = 3x + 24$

Company T: $y = 4x + 10$

Company R stated, "We have 42 employees, the same number of employees as company T has this year." Determine if company R's claim is possible. Explain your reasoning.

Company T stated, "After 15 years, we will have the same number of employees as company R." Determine if company T's claim is possible. Explain your reasoning.

Company R's claim is wrong. After 6 years, they will have 42 employees. Company T will have 24 employees after 6 years. So, Company R will have more employees, not the same. Company T's claim was also wrong. In 15 years, they will have 70 employees. Company R will have 105 employees in 15 years. Both claims were wrong this time. Company R will have more employees, and company T will have more years.
This response receives partial credit. The response includes three of the five required elements:

- The response indicates that neither claim is possible (Company R’s claim is wrong) and (Company T’s claim was also wrong).

- The response provides a partial explanation for why Company R’s claim is impossible (After 6 years, they will have 42 employees. Company T will have 24 employees after 6 years).

The explanation is partial because it shows the correct number of years (6) for when company R has 42 employees and an incorrect number of employees (24) for Company T after 6 years. A complete explanation would show the correct number of employees company T would have after 6 years (34).

- The response provides a partial explanation for why Company T’s claim is impossible (In 15 years, they will have 70 employees. Company R will have 105 employees in 15 years).

The explanation is partial because it shows the correct number of workers for company T after 15 years (70). The number of employees for company R after 15 years (105) is incorrect. A complete explanation would show the correct number of employees for both companies after 15 years.
Two rival companies began the same year. The equations below model the number of employees, \( y \), at these companies \( x \) years after the companies began.

Company R: \( y = 3x + 24 \)

Company T: \( y = 4x + 10 \)

Company R stated, "We have 42 employees, the same number of employees as company T has this year." Determine if company R's claim is possible. Explain your reasoning.

Company T stated, "After 15 years, we will have the same number of employees as company R." Determine if company T's claim is possible. Explain your reasoning.

\[ \text{statement 1: cant happen because with there employment they cant both get 42.} \]
\[ \text{statement 2: no because the companies would be 1 employee off.} \]
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<th>Annotation</th>
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| **Anchor Paper 7**  
**Score Point 1** |

This response receives partial credit. The response includes two of the five required elements:

- The response indicates that neither claim is possible (statement 1: cant happen) and (statement 2: no).

- The response provides a partial explanation for why Company T’s claim is impossible (because the companies would be 1 employee off).

The explanation receives partial credit. It is a true statement because the number of employees at 15 years, 69 for R and 70 for T, have a difference of 1. $[70 - 69 = 1]$. 
Two rival companies began the same year. The equations below model the number of employees, $y$, at these companies $x$ years after the companies began.

Company R: $y = 3x + 24$

Company T: $y = 4x + 10$

Company R stated, "We have 42 employees, the same number of employees as company T has this year." Determine if company R’s claim is possible. Explain your reasoning.

Company T stated, "After 15 years, we will have the same number of employees as company R." Determine if company T’s claim is possible. Explain your reasoning.

Both of the companies statements are wrong. This is so because both of the companies equations do not add up to eachother. It isn't possible.
Annotation

Anchor Paper 8
Score Point 1

This response receives partial credit. The response includes one of the five required elements:

- The response indicates that neither claim is possible (Both of the companies statements are wrong).
Two rival companies began the same year. The equations below model the number of employees, \( y \), at these companies \( x \) years after the companies began.

Company R: \( y = 3x + 24 \)

Company T: \( y = 4x + 10 \)

Company R stated, "We have 42 employees, the same number of employees as company T has this year." Determine if company R's claim is possible. Explain your reasoning.

Company T stated, "After 15 years, we will have the same number of employees as company R." Determine if company T's claim is possible. Explain your reasoning.

**both of the statements are possible because they can both have the same number of workers as each other even though they are separate companies**
Annotation

Anchor Paper 9
Score Point 0

This response receives no credit. The response includes none of the five required elements.
Two rival companies began the same year. The equations below model the number of employees, \( y \), at these companies \( x \) years after the companies began.

Company R: \( y = 3x + 24 \)

Company T: \( y = 4x + 10 \)

Company R stated, “We have 42 employees, the same number of employees as company T has this year.” Determine if company R’s claim is possible. Explain your reasoning.

Company T stated, “After 15 years, we will have the same number of employees as company R.” Determine if company T’s claim is possible. Explain your reasoning.

Company t’s claim is not possible because the equation don’t have the same answer.
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<tr>
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<tr>
<td><strong>Score Point 0</strong></td>
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<tr>
<td>This response receives no credit. The response includes none of the five required elements.</td>
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<tr>
<td>The response only states that one claim is not possible. The item requires an indication that neither claim is possible.</td>
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Practice Set
P1 - P5

No Annotations Included
Two rival companies began the same year. The equations below model the number of employees, \( y \), at these companies \( x \) years after the companies began.

Company R: \( y = 3x + 24 \)

Company T: \( y = 4x + 10 \)

Company R stated, "We have 42 employees, the same number of employees as company T has this year." Determine if company R's claim is possible. Explain your reasoning.

Company T stated, "After 15 years, we will have the same number of employees as company R." Determine if company T's claim is possible. Explain your reasoning.

It is not possible because company T would have to have started 2 years before company R to have to same amount of employees.

They will not have the same amount. Company T will have one more employee than Company R.
Two rival companies began the same year. The equations below model the number of employees, $y$, at these companies $x$ years after the companies began.

Company R: $y = 3x + 24$

Company T: $y = 4x + 10$

Company R stated, “We have 42 employees, the same number of employees as company T has this year.” Determine if company R’s claim is possible. Explain your reasoning.

Company T stated, “After 15 years, we will have the same number of employees as company R.” Determine if company T’s claim is possible. Explain your reasoning.

no because they will have 42 employees after 6 years and 6 years at T they will have 34
After 15 years R will have 69 and T will have 70 so they do not have the same after 15 years
Two rival companies began the same year. The equations below model the number of employees, \( y \), at these companies \( x \) years after the companies began.

Company R: \( y = 3x + 24 \)

Company T: \( y = 4x + 10 \)

Company R stated, “We have 42 employees, the same number of employees as company T has this year.” Determine if company R’s claim is possible. Explain your reasoning.

Company T stated, “After 15 years, we will have the same number of employees as company R.” Determine if company T’s claim is possible. Explain your reasoning.

Company R and company T’s claims are both impossible because \( 3x + 24 \) answer does not match Company B’s \( 4x + 10 \). They would not have the same amount of employees.
Two rival companies began the same year. The equations below model the number of employees, $y$, at these companies $x$ years after the companies began.

Company R: $y = 3x + 24$

Company T: $y = 4x + 10$

Company R stated, “We have 42 employees, the same number of employees as company T has this year.” Determine if company R’s claim is possible. Explain your reasoning.

Company T stated, “After 15 years, we will have the same number of employees as company R.” Determine if company T’s claim is possible. Explain your reasoning.

$x = 12$ so company T would have 58 employees so its impossible
$x = 15$ so company R wuld have 69 employees and company T would have 70 employees so it isn’t possible
Two rival companies began the same year. The equations below model the number of employees, \( y \), at these companies \( x \) years after the companies began.

Company R: \( y = 3x + 24 \)

Company T: \( y = 4x + 10 \)

Company R stated, “We have 42 employees, the same number of employees as company T has this year.” Determine if company R’s claim is possible. Explain your reasoning.

Company T stated, “After 15 years, we will have the same number of employees as company R.” Determine if company T’s claim is possible. Explain your reasoning.

\[
\begin{align*}
y &= 3x + 24 \\
3x + 24 &= 42 \\
3x &= 18 \\
x &= \square 6 \text{ years} \\
4x6 + 10 &= 50 \text{ EMPLOYEES} \\
The \text{ claim that both companies have 42 employees cannot be true.} \\
3(15) + 24 &= 69 \text{ employees} \\
4(15) + 10 \square &= \square 70 \text{ employees} \\
The \text{ claim that in 15 years the companies will have the same number of employees isn’t true.}
\end{align*}
\]
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