

Week 11

This week in a nutshell:

Question 5, for the third week in a row, looks at one aspect of trigonometry, and a calculator (set to degrees) will be needed. Answers have been rounded to a suitable degree of accuracy, which you are welcome to adjust depending on your students' requirements. It may be worth reminding students of the procedure for their calculator when taking the trigonometric inverse. The other questions provide practice in familiar topics to continue to build fluency and confidence.

Question 1: Product of primes

Question 2: Increase/decrease by a given percentage

Question 3: Rounding (significant figures)

Question 4: Writing algebraic expressions

Question 5: Using trigonometry to find the size of an angle in a right-angled triangle

The questions aim to develop and deepen understanding over the week. Due to the necessity of the topics covered this week, there is an emphasis on the interchangeability of command words, and language flexibility. It may be worth taking some extra time this week to make sure your students are developing their mathematical literacy.

This week's ideas for class discussion include:

Question 1: **Product of primes**

- The prime factorisation of a number is its unique address; discuss.

Question 2: **Increase/decrease by a given percentage**

- What happens if you increase an amount by 10% then decrease the answer by 10%?

Question 3: **Rounding (significant figures)**

- Why are not all the digits significant?

Question 4: **Writing algebraic expressions**

- Should there be a "dictionary of algebra"?
- Should algebra be recognised as a language?

Question 5: **Using trigonometry to find the size of an angle in a right-angled triangle**

- What are the inverse trigonometric functions called?

Week 11: Day 1

- 1) Write 195 as a product of primes.

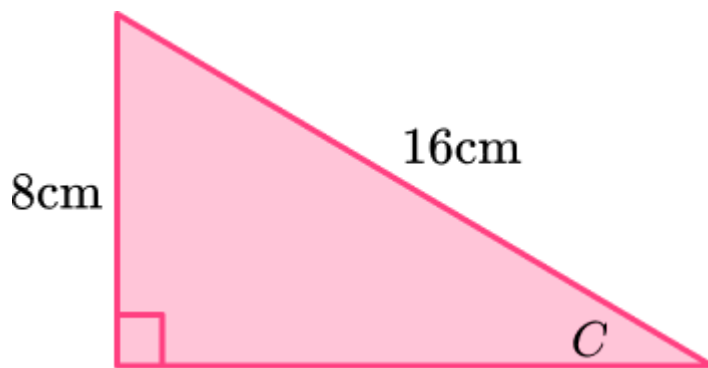
- 2) Increase 40 by 20%.

- 3) Round 2673 to two significant figures.

- 4) Using n as the variable, write an algebraic expression that means the same as,

“Sixteen added to three lots of a number”

- 5) Use trigonometry to find the size of angle C .



Week 11: Day 1 Answers

1) Write 195 as a product of primes. $3 \times 5 \times 13$

2) Increase 40 by 20%. 48

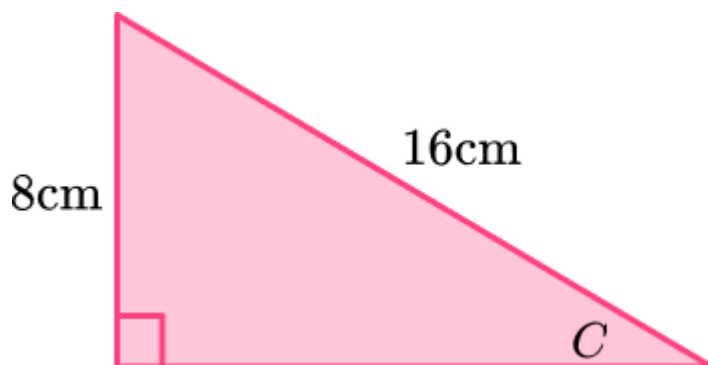
3) Round 2673 to two significant figures. 2700

4) Using n as the variable, write an algebraic expression that means the same as,

“Sixteen added to three lots of a number”

$$3n + 16$$

5) Use trigonometry to find the size of angle C . 30°



Week 11: Day 2

1) Write 72 as a product of primes using index notation.

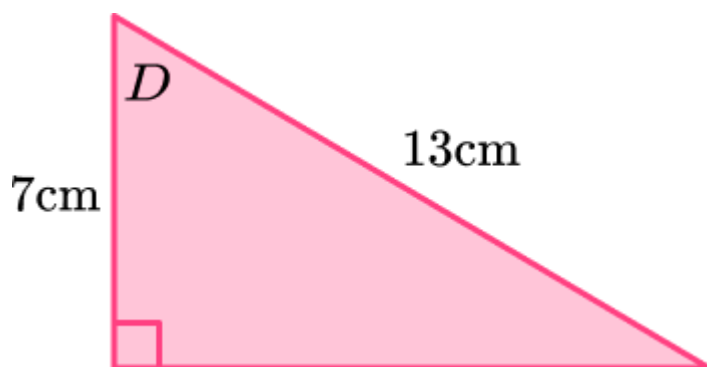
2) Increase 72 by 15%.

3) Round 891 to one significant figure.

4) Using n as the variable, write an algebraic expression that means the same as,

“A number subtracted from eleven, all multiplied by five”

5) Use trigonometry to find the size of angle D .



Week 11: Day 2 Answers

1) Write 72 as a product of primes using index notation. $2^3 \times 3^2$

2) Increase 72 by 15%. 82.8

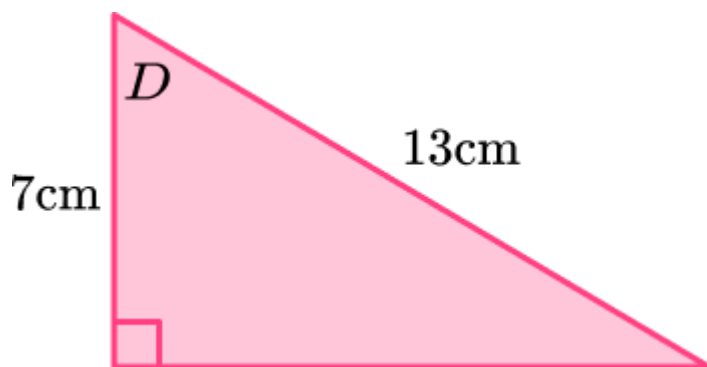
3) Round 891 to one significant figure. 900

4) Using n as the variable, write an algebraic expression that means the same as,

“A number subtracted from eleven, all multiplied by five”

$$5(11 - n)$$

5) Use trigonometry to find the size of angle D . 57.4° (to 1dp)



Week 11: Day 3

1) Write 144 as a product of primes using index notation.

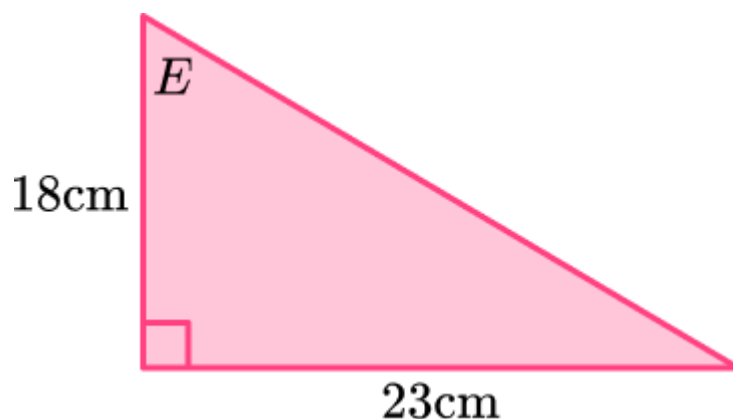
2) Decrease 90 by 30%.

3) Round 2.459 to two significant figures.

4) Using n as the variable, write an algebraic expression that means the same as,

“A number divided by four that is then added to twenty-three”

5) Use trigonometry to find the size of angle E .



Week 11: Day 3 Answers

- 1) Write 144 as a product of primes using index notation. $2^4 \times 3^2$

- 2) Decrease 90 by 30%. 63

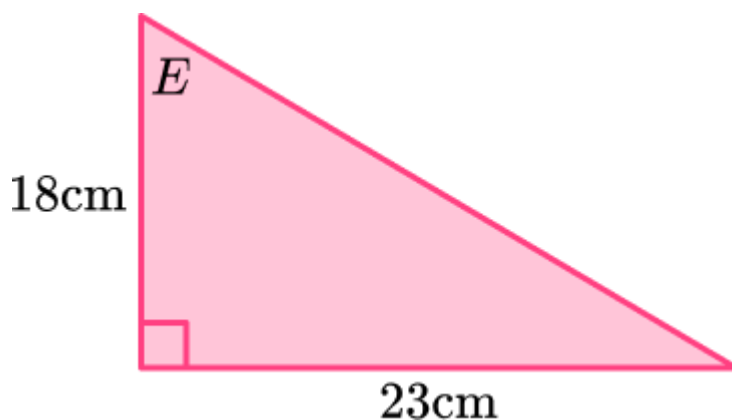
- 3) Round 2.459 to two significant figures. 2.5

- 4) Using n as the variable, write an algebraic expression that means the same as,

“A number divided by four that is then added to twenty-three”

$$23 + \frac{n}{4}$$

- 5) Use trigonometry to find the size of angle E . 52.0° (to 1dp)



Week 11: Day 4

1) Write 320 as a product of primes using index notation.

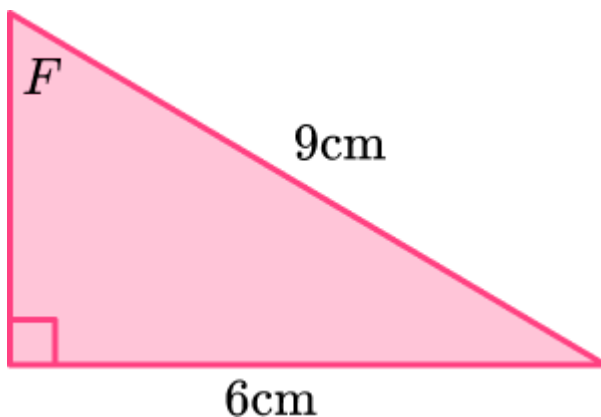
2) Decrease 70 by 15%.

3) Round 65396023 to three significant figures.

4) Using n as the variable, write an algebraic expression that means the same as,

“Eighteen divided by the result of six plus a number”

5) Use trigonometry to find the size of angle F .



Week 11: Day 4 Answers

1) Write 320 as a product of primes using index notation. $2^6 \times 5$

2) Decrease 70 by 15%. 59.5

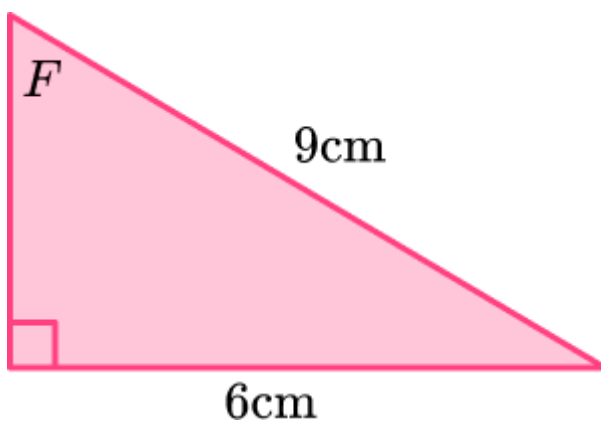
3) Round 65396023 to three significant figures. 65400000

4) Using n as the variable, write an algebraic expression that means the same as,

“Eighteen divided by the result of six plus a number”

$$\frac{18}{6+n}$$

5) Use trigonometry to find the size of angle F . 41.8° (to 1dp)



Week 11: Day 5

1) Write 440 as a product of primes using index notation.

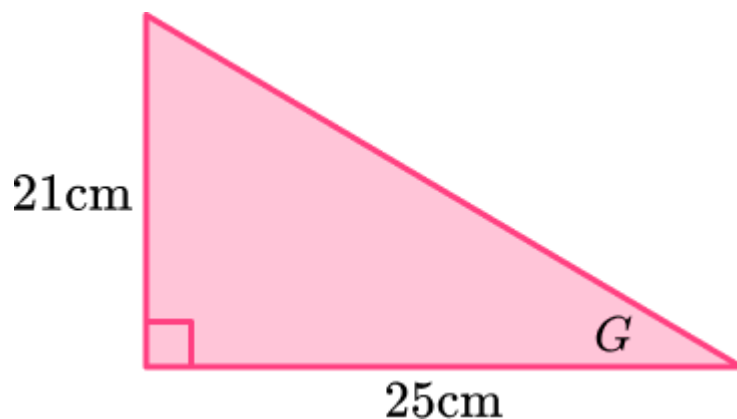
2) Increase 120 by 35%.

3) Round 0.005663 to two significant figures.

4) Using n as the variable, write an algebraic expression that means the same as,

“Half of the sum of thirteen and a number”

5) Use trigonometry to find the size of angle G .



Week 11: Day 5 Answers

1) Write 440 as a product of primes using index notation. $2^3 \times 5 \times 11$

2) Increase 120 by 35%. 162

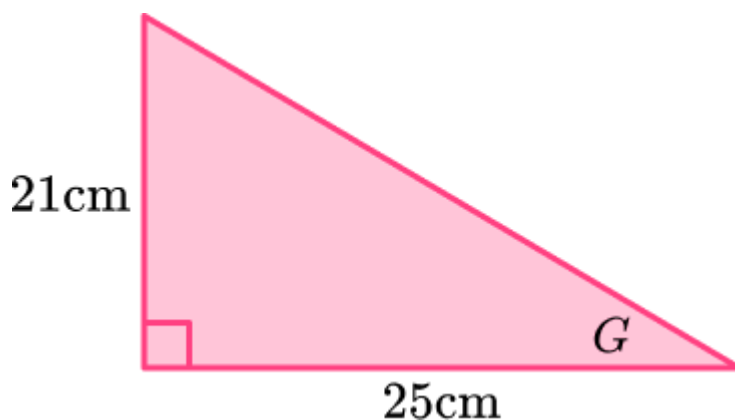
3) Round 0.005663 to two significant figures. 0.0057

4) Using n as the variable, write an algebraic expression that means the same as,

“Half of the sum of thirteen and a number”

$$\frac{13+n}{2} \text{ or } \frac{1}{2}(13 + n)$$

5) Use trigonometry to find the size of angle G . 40.0° (to 1dp)



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