S2 Final Assessment Revision Booklet A MP1/2

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Pythagoras

Exercise 11.4

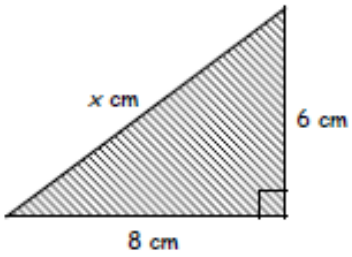
1. Copy and complete to calculate the length of the hypotenuse :-

$c^2 = a^2 + b^2$

$x^2 = 8^2 + 6^2$

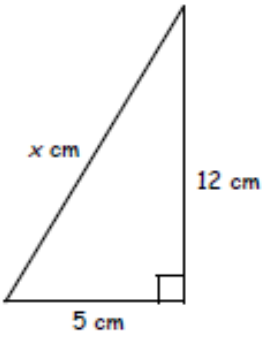
$x^2 = 100$

$x = \sqrt{100} = ...$



2. Use Pythagoras' Rule to calculate the length of the hypotenuse in each of these triangles. (*Round to two decimal places where necessary*).

a



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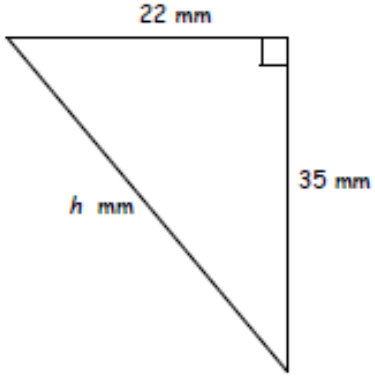

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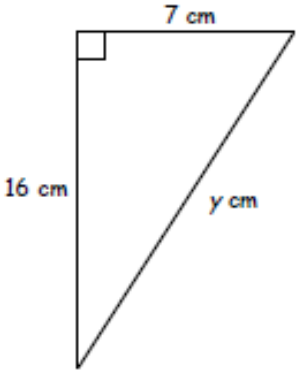

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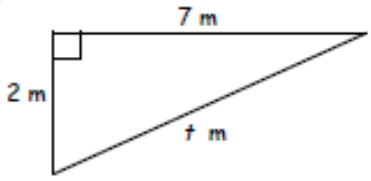

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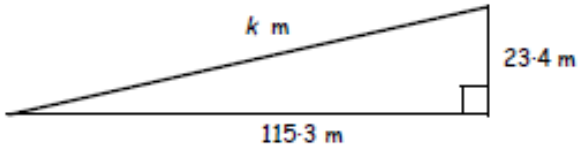

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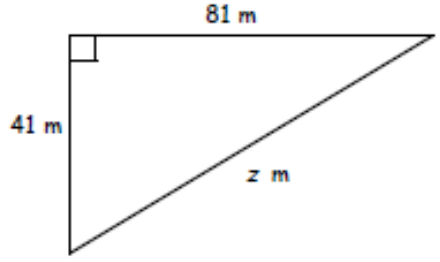
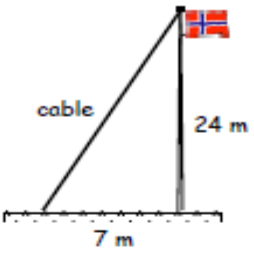


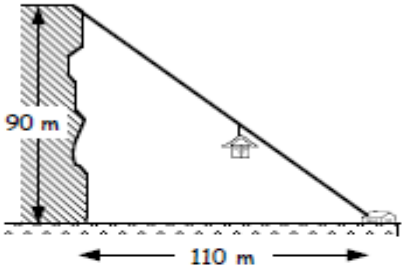
Pythagoras

Exercise 11.5

1. A flagpole is supported by a cable as shown in the diagram.

   Calculate the length of the cable.



2. 

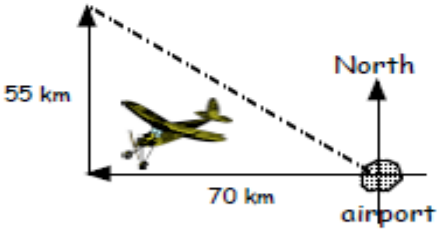
A cable car is used to get to the top of a cliff.

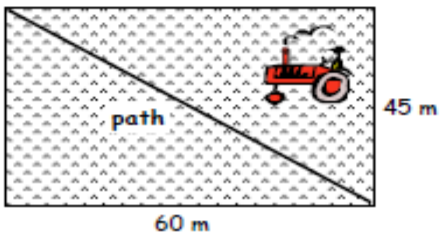
Calculate the length of cable, to the nearest metre.

3. A small plane left the airport and flew 70 km due West.

   The plane then turned due North and flew for 55 km.

   If the plane then flew straight back to the airport, how far did it fly ?



4. 

A farmer has a rectangular field 60 m by 45 m.

If the farmer wanted to make a diagonal path across the field, how long would the path be ?

5. An army tank travels from HQ due South for 8 km.

   The tank then turns due East and travels for 5 km.

   The tank then drives directly back to HQ.

   a Calculate the **total distance** the tank travelled. (Drawing a diagram might help).

   b Write down your answer to the nearest metre.

Pythagoras

Exercise 11.6

1. Copy and complete to find the missing length:-

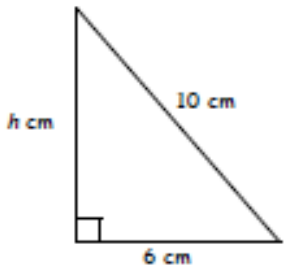
$a^2 = c^2 - b^2$

$h^2 = 10^2 - 6^2$

$h^2 = \ldots\ldots - \ldots\ldots$

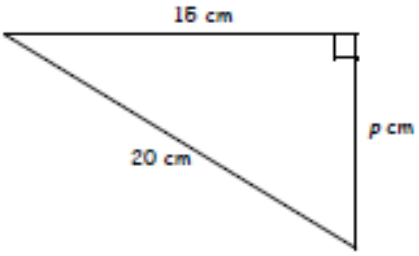
$h^2 = \ldots\ldots$

$h = \sqrt{\ldots\ldots} = \ldots\ldots$

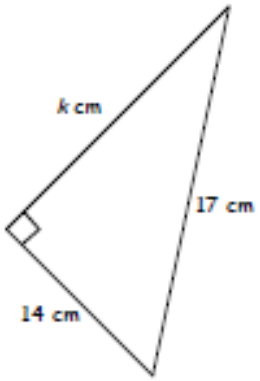


2. Calculate the length of each missing side in the triangles below :-

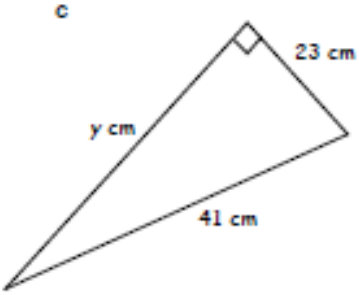
a



b



c

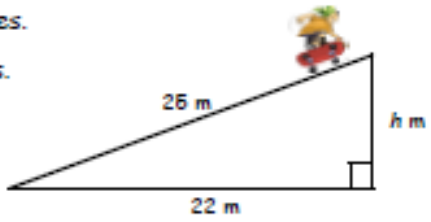


3. A skateboard ramp has a length of 25 metres.

The horizontal distance shown is 22 metres.

a Calculate the height of the ramp to 2 decimal places.

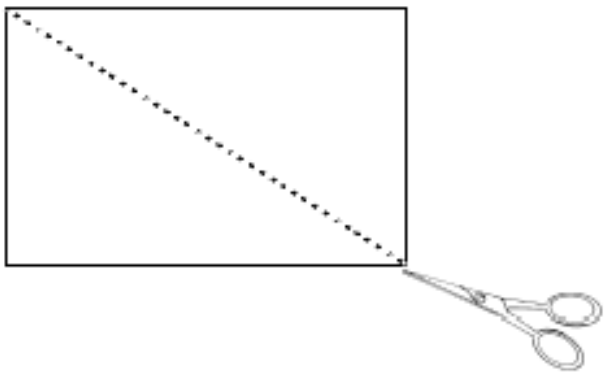
b Write your answer to the nearest centimetre.



4. A large rectangular piece of card is to be cut into two pieces by cutting along the diagonal.

The length of the card is 80 centimetres and the diagonal length is 92 centimetres.

Calculate to the nearest millimetre the width of the card.

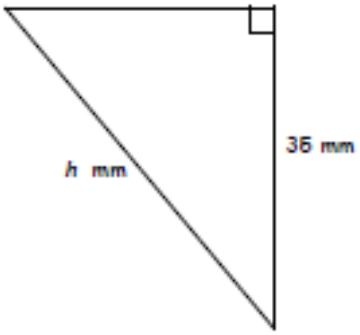


Pythagoras

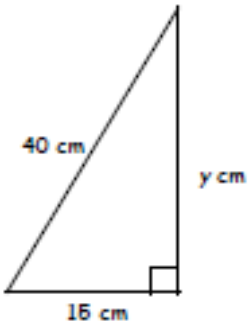
Exercise 11.7

1. Find the value of the letter in each of the following :-

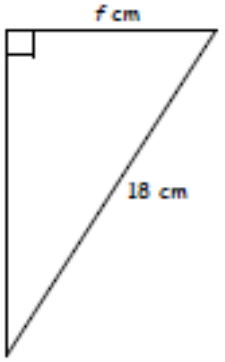
a



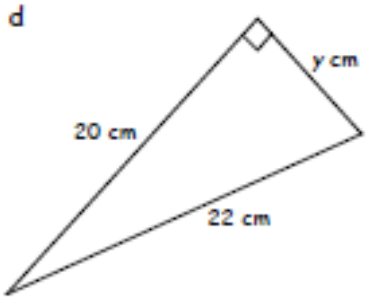
b



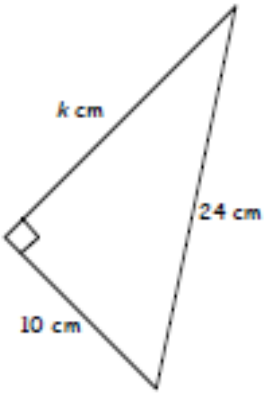
c



d



e



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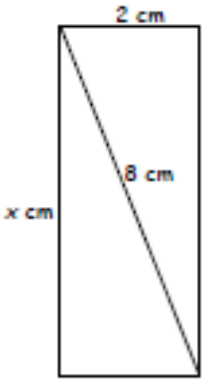
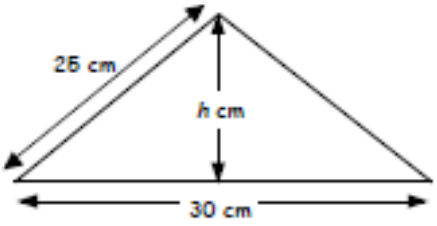


2. A jeep drives due North for 30 kilometres then turns due West.

   The jeep drives for a while then turns and drives the 50 kilometres directly back to where it started.

   How far in total did the jeep drive ?

3.



Calculate the height of the roof with dimensions as shown in the diagram.

Answers

[redacted]2

1. a 4 b 7
2. a 5 b 10 c 9
   d 8 e 1 f 13
3. a 4·47 b 10·49 c 17·32
   d 3·61 e 8·94 f 35·13
4. 8 cm
5. a 81 cm2 b 16 cm2 c 65 cm2

Exercise 11.3

1. a 9, 16, 25 b 25

Exercise 11.4

1. 10 cm
2. a 13 cm b 41·34 cm c 17·46 cm
   d 7·28 m e 117·65 m f 90·79 m

Exercise 11.5

1. 25 m
2. 142 m
3. 89·02 km
4. 75 m
5. a 22·43 km b 22434 m

Exercise 11.6

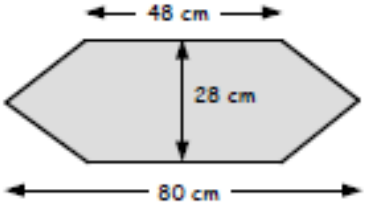
1. 8 cm
2. a 13·23 m b 9·64 cm c 33·94 cm
3. a 11·87 m b 1187 cm
4. 45 mm

Exercise 11.7

1. a 41·34 mm b 37·08 cm c 8·25 cm
   d 9·17 cm e 23·26 cm f 7·75 cm
2. 40 km
3. 20 cm
4. 8·66 cm

Enlargement/Reduction

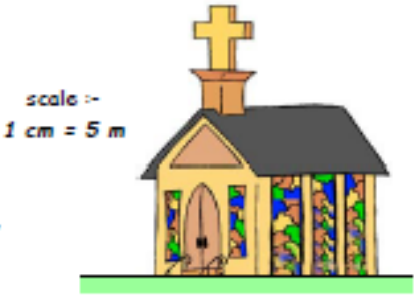
7. Draw a neat **2 times** enlargement of this shape.

8. 

Make an accurate drawing of this shape but with its dimensions **one quarter** of those shown.

9. A church is to be drawn using a scale of **1 cm represents 5 metres.**

If the height in the scale drawing is 4·5 cm, find the height of the real church.



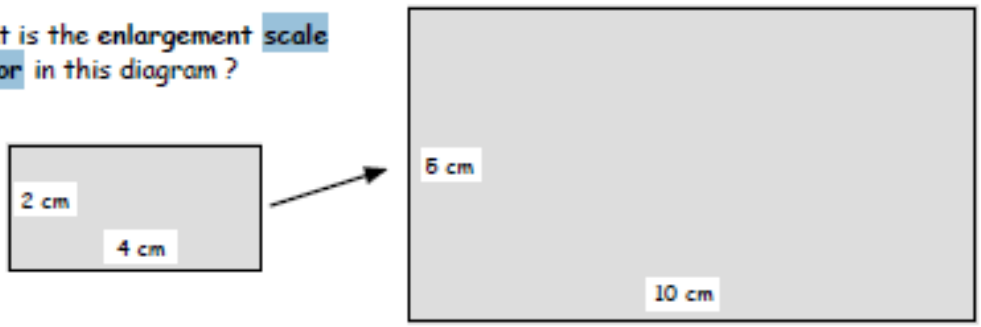
10.

A model of a house is to be built $\frac{1}{40}$ of its real size.

The actual house is 12 metres tall.

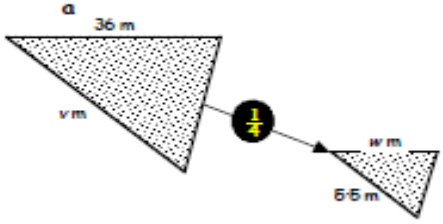
What will the height of the model be, in centimetres ?

11. What is the **enlargement scale factor** in this diagram ?

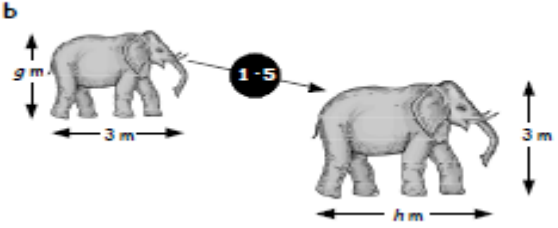


12. The scale factors of each diagram below are shown. Find the values of *v*, *w*, *g* and *h*.

a



b



Answers

7. Check diagram
8. Check diagram
9. 22·6 m
10. 30 cm
11. 25
12. a $w = 9$, $v = 22$ b $h = 4·6$, $g = 2$

Financial Maths

Exercise 2 **Best Buys - Money Management**

1. A tin of dog food is offered in two different sizes.
   - The small tin costs £3·45 for 600 grams.
   - The large tin costs £6 for one kilogram.

   Which one is the better deal ? Explain.

2. Which is the better deal for each of the following and explain your answers ?
   a A box of fudge costs £3·99 for a 475 gram box or £5·20 for a 650 gram box.
   b Tennis balls - box of 9 for £19·26 or box of 12 for £25·68.

3. Cartons of apple juice are sold in different sizes.

   Which is the best deal ? *Explain.*

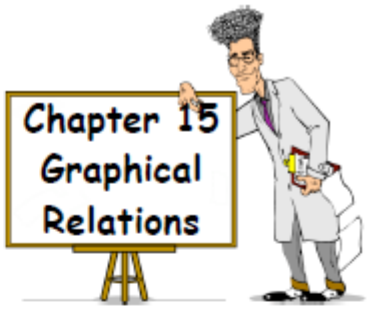
450 ml costs	-	81p
1 litres costs	-	£1·60
2·5 litres costs	-	£3·50

Answers

Ch 2 Ex 2 Best Buys - Money Management

1. Small 57·5p per 100g Large 60p per 100g
   Small tin better value
2. a small 21p per 25g, large 20p per 25g.
   Larger is cheaper.
   b 9 box £2·14 each, 12 box £2·14. Same price.
3. 450 ml 9p per 50 ml, 1l 8p per 50 ml,
   2·5 l 7p per 50 ml. Largest is best

Straight Line



Exercise 15.1

1. a Copy and complete the table for $y = 2x$.

x	0	1	2	3
y	..	..	..	..

   b Write down the coordinates produced.

   c Draw a set of axes and plot these points. (Points should lie in a straight line).

2. Repeat question 1 for each of these equations :-

   a $y = 4x$ b $y = 7x$ c $y = 1{\cdot}5x$.

3. a Copy and complete the table for $y = 3x$.

x	-2	-1	0	1
y	..	..	..	..

   b Show that $y = 3x$ is the equation of a straight line.

Exercise 15.2

1. a Copy and complete the table for $y = 3x + 1$.

x	0	1	2	3
y	..	..	..	..

   b Write down the coordinates produced, plot the points on a diagram and draw a straight line through the points.

2. Repeat question 1 for each of these equations :-

   a $y = 2x + 5$ b $y = x + 3$ c $y = 3x - 1$.

3. Repeat question 1 using each table below :-

   a $y = 4x - 3$

x	-1	0	1	2
y	..	..	..	..

   b $y = 2x - 5$

x	-2	-1	0	1
y	..	..	..	..

   c $y = 2 - x$

x	-2	-1	0	1
y	..	..	..	..

   d $y = 0{\cdot}5x + 1$.

x	-4	-2	0	2
y	..	..	..	..

4. What can you say about the lines $y = 5x + 1$, $y = 5x + 6$ and $y = 5x - 3$?

Answers

Exercise 15.1

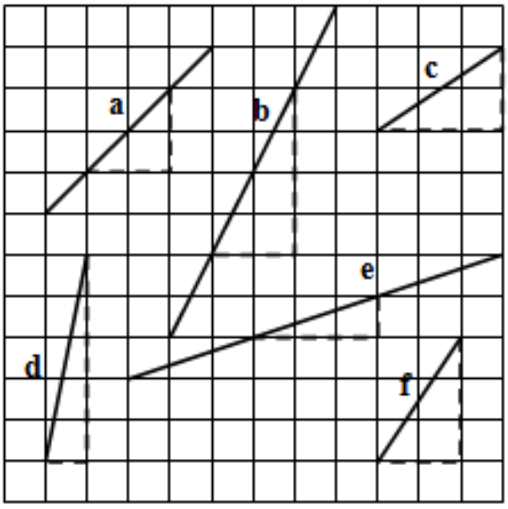
1. a 0, 2, 4, 6 b (0,0), (1,2), (2,4), (3,6)
   c see line through these points
2. a 0, 4, 8, 12, (0,0), (1,4), (2,8), (3,12), see line
   b 0, 7, 14, 21, (0,0), (1,7), (2,14), (3,21), see line
   c 0, 1·5, 3, 4·5, (0,0), (1,1·5), (2,3), (3,4·5), see line
   [redacted]0, 3b see line through these points

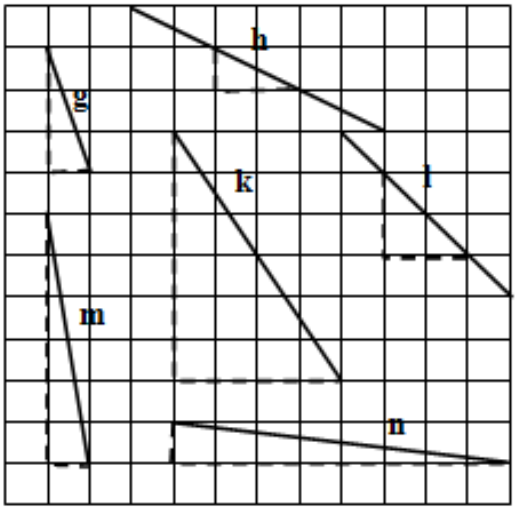
Exercise 15.2

1. a 1, 4, 7, 10 b (0,1), (1,4), (2,7), (3,10)
   c see line through these points
2. a 5, 7, 9, 11, (0,5), (1,7), (2,9), (3,11), see line
   b 3, 4, 5, 6, (0,3), (1,4), (2,5), (3,6), see line
   c –1, 2, 5, 8, (0,–1), (1,2), (2,5), (3,8), see line

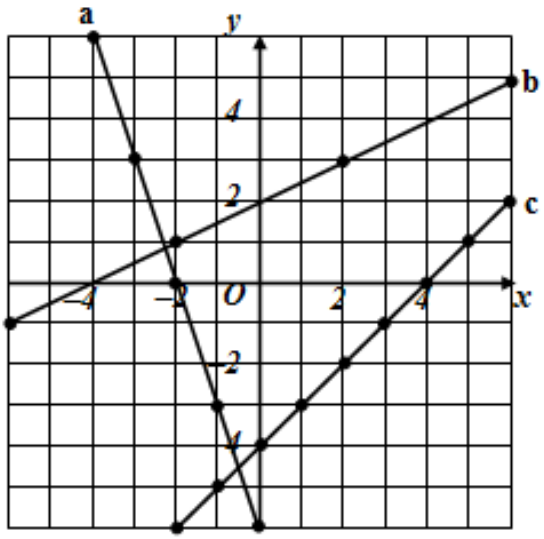
Straight Line

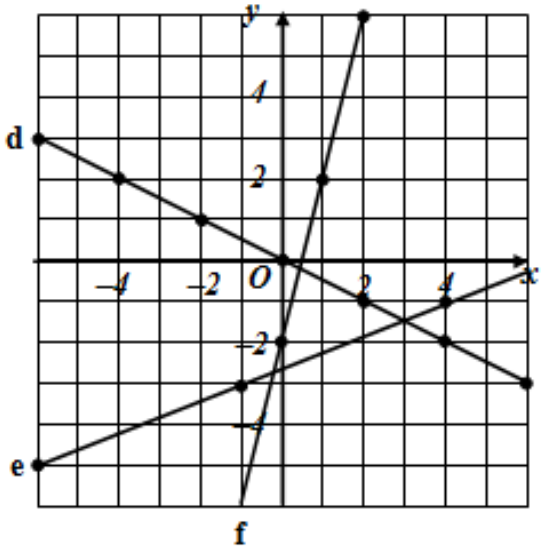
Q1. Find the **gradients** of the lines shown in each of the diagrams below





Q2. Find the **gradients** of the lines below





Q3. Plot the following pairs of points and calculate the gradient of the line joining them.

a. (2, 1) and (6, 3) **b**. (1, 5) and (3, 1) **c**. (2, 0) and (4, 6)

d. (−2, −3) and (2, 3) **e**. (−1, 2) and (5, −1) **f**. (−4, 2) and (4, −4)

g. (−6, −2) and (−5, 3) **h**. (4, −3) and (6, 5) **i**. (−2, 3) and (0, −2)

Answers

Linear Relationships ~ Gradients

Q1.	**a.** 1	**b.** 2	**c.** $^{2}/_{3}$	**d.** 5	**e.** $^{1}/_{3}$	**f.** $^{3}/_{2}$
	g. –3	**h.** $-^{1}/_{2}$	**k.** $-^{3}/_{2}$	**l.** –1	**m.** –6	**n.** $-^{1}/_{8}$
Q2.	**a.** –3	**b.** ½	**c.** 1	**d.** – ½	**e.** $^{2}/_{5}$	**f.** 4
Q3.	**a.** ½	**b.** –2	**c.** 3	**d.** $^{3}/_{2}$	**e.** – ½	**f.** –3
	g. 5	**h.** 4	**i.** $-^{5}/_{2}$			

Straight Line

Linear Relationships ~ Straight Lines

Q1. For each line, write down the gradient and the coordinates of the point where it crosses the y – axis.

a.	$y = 3x + 1$	**b.**	$y = \frac{1}{2}x - 5$	**c.**	$y = -2x + 3$
d.	$y = -\frac{1}{4}x - 2$	**e.**	$y = 8x - \frac{1}{2}$	**f.**	$y = -x + 4$

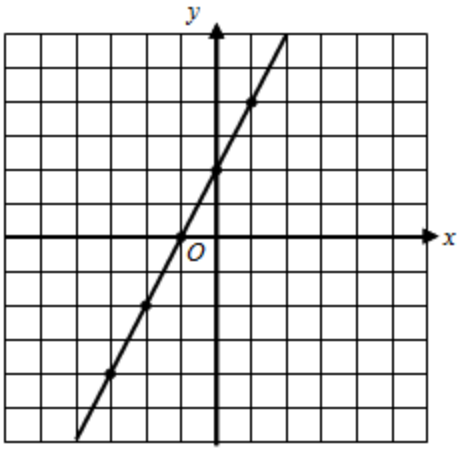
Q2. Match these equations with the graphs shown below.

1.	$y = x + 1$	**2.**	$y = -2x - 3$	**3.**	$y = \frac{1}{2}x + 4$
4.	$y = -\frac{1}{4}x + 2$	**5.**	$y = 6x - 2$	**6.**	$y = 3x - 5$

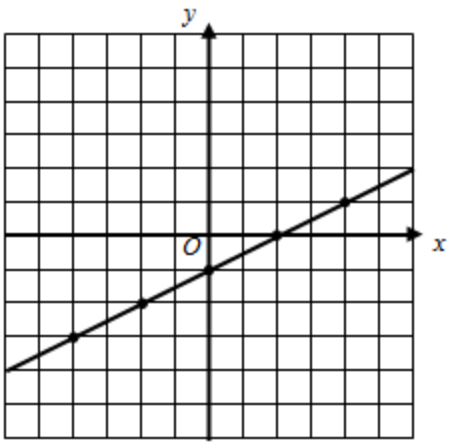
Straight Line

Q4. Write down the equation of the lines drawn in the diagrams below.

a.



b.



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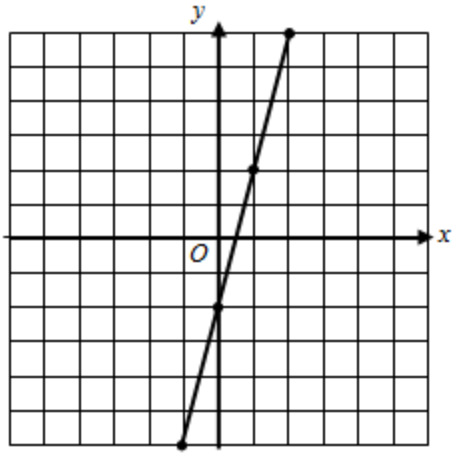

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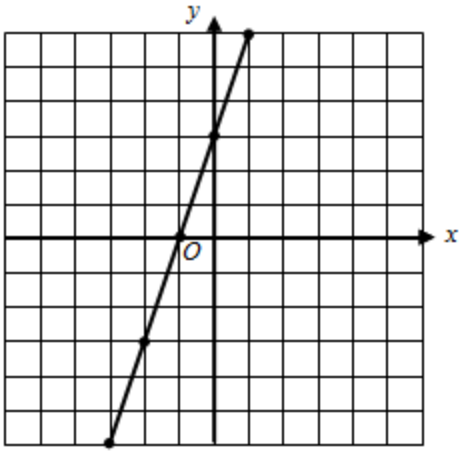

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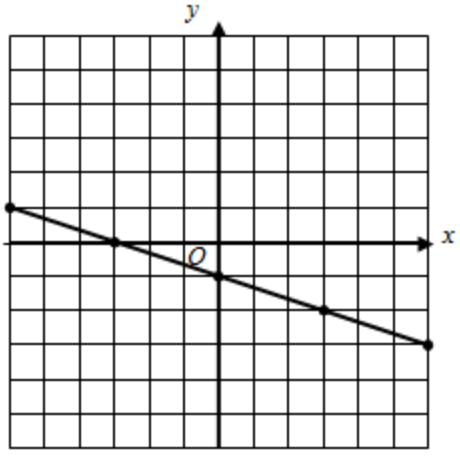

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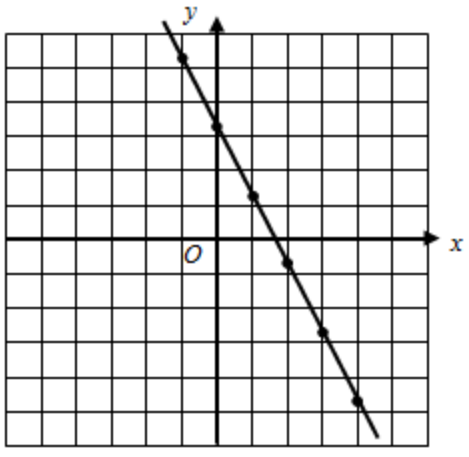


Answers

Linear Relationships ~Straight Lines

Q1. **a.** 3, (0,1) **b.** ½, (0, −5) **c.** −2, (0, 3)
d. $-\frac{1}{4}$, (0, −2) **e.** 8, (0, −½) **f.** −1, (0, 4)

Q2. **a.** 5 **b.** 1 **c.** 4 **d.** 2 **e.** 6 **f.** 3

Rounding

Exercise 1.5

1. Copy each number and round to **1 decimal place** :-

   a 16·86 → ..... b 70·49 → ..... c 1·95 → .....

2. Round each number to **1 decimal place** :-

   a 9·647 b 99·561 c 180·1904.

3. Last week, 4·67 centimetres of rain fell in Motherwell.
   Round this number to **one decimal place.**

Exercise 1.6

1. Copy each number and round to **2 decimal places** :-

   a 4·627 → ..... b 16·4921 → ..... c 2·8552 → .....

2. Round each number to **2 decimal places** :-

   a 3·777 b 10·84499 c 11·1991.

3. A book is 4·824 centimetres thick.
   Round this number to **two decimal places.**

Answers

Exercise 1.5

1. a 16·9 b 70·5 c 2·0
2. a 9·6 b 99·6 c 180·2
3. 4·7

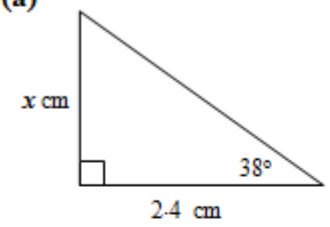
Exercise 1.6

1. a 4·63 b 16·49 c 2·86
2. a 3·78 b 10·84 c 11·20
3. 4·82 cm

Trigonometry

1. Use the **tangent** ratio to calculate the length of the side marked ***x*** in these right-angled triangles.

(a)



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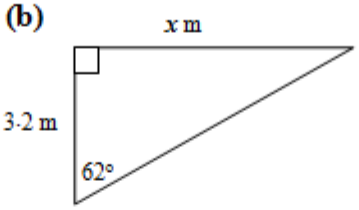

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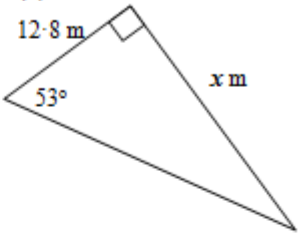

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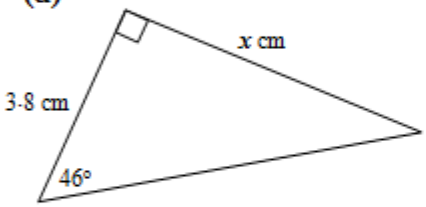

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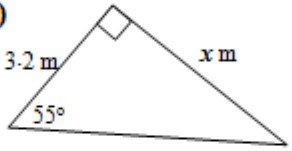

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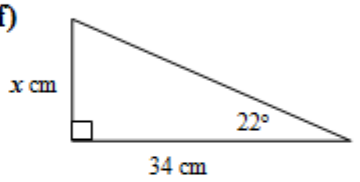

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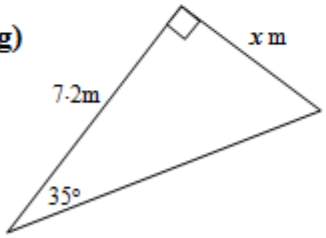

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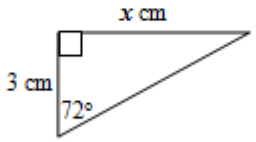

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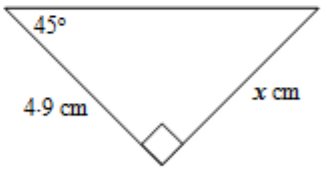

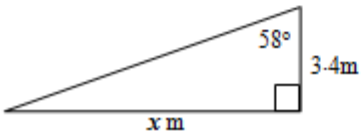

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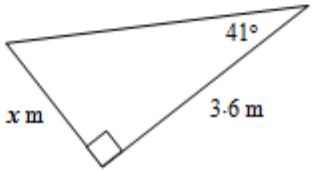

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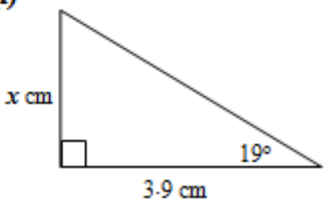
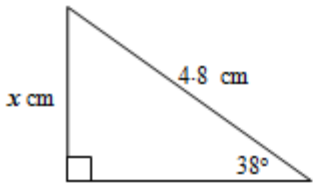


Trigonometry

2. Use the **sine** ratio to calculate the length of the side marked x in these right-angled triangles.

(a)



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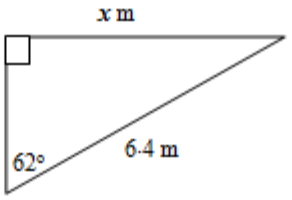

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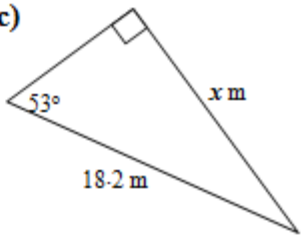

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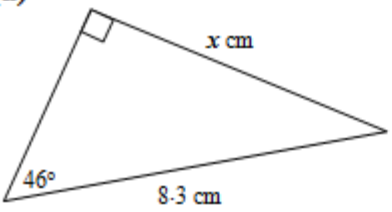

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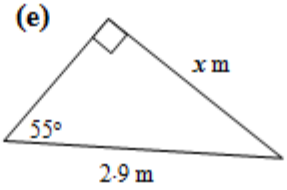

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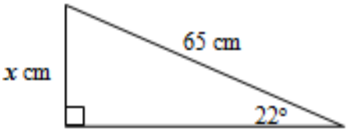

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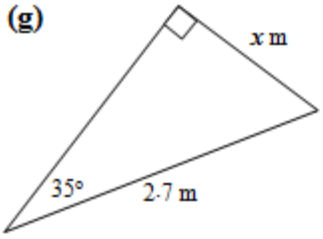

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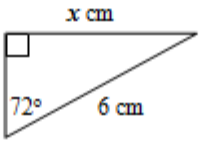

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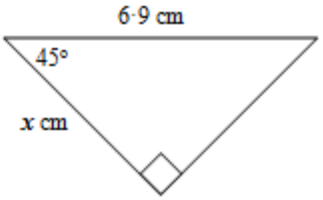

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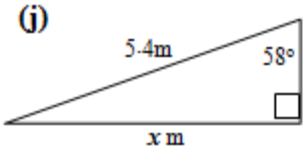

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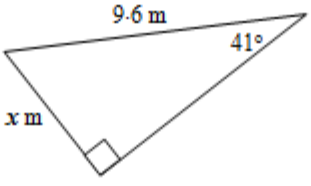

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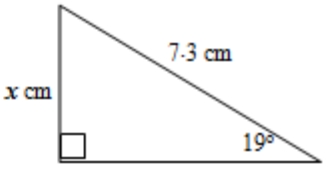
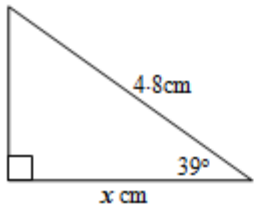


Trigonometry

3. Use the **cosine** ratio to calculate the length of the side marked x in these right-angled triangles.

(a)



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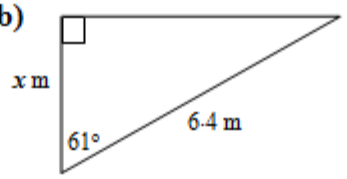

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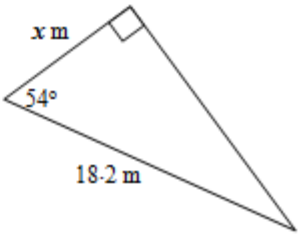

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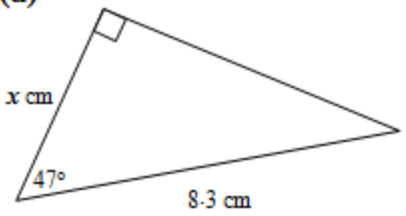

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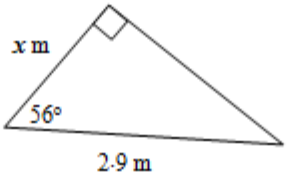

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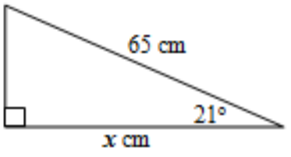

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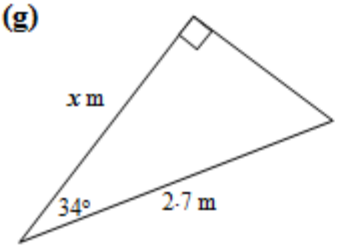

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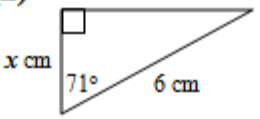

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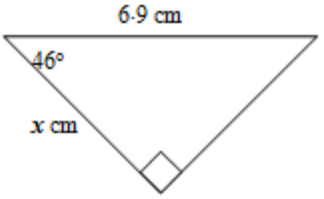

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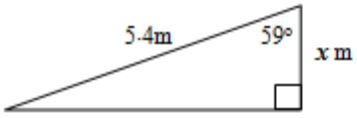

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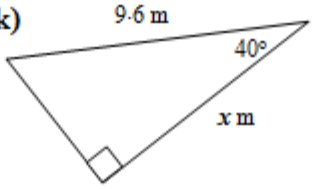

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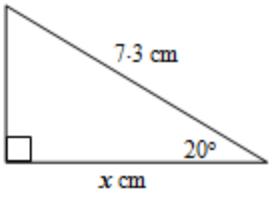
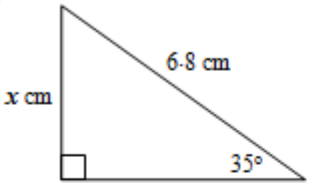


Trigonometry

4. Calculate the length of the side marked x in these right-angled triangles. You will have to choose which ratio to use.

(a)



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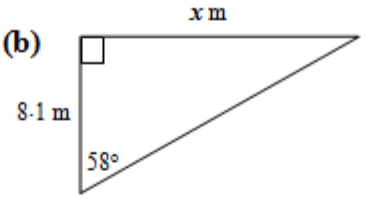

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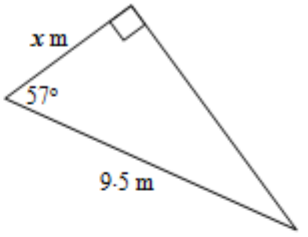

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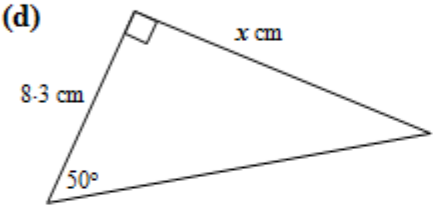

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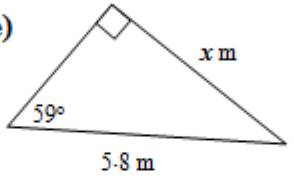

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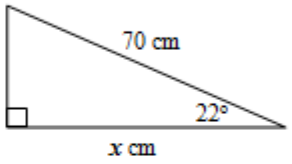

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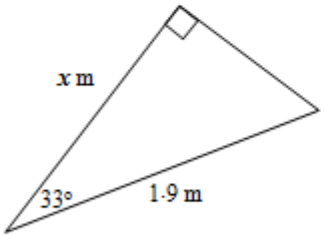

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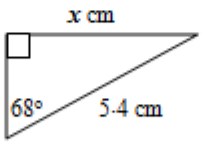

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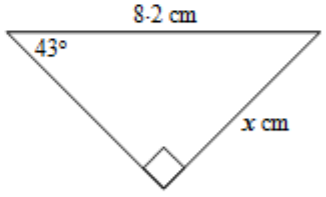

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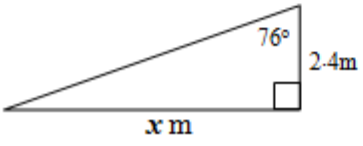
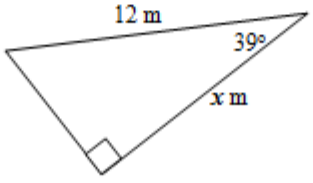
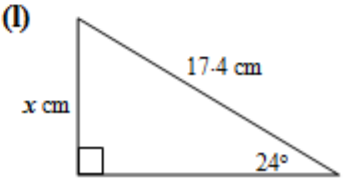


(k)



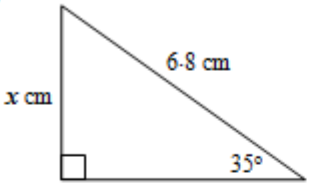
(l)



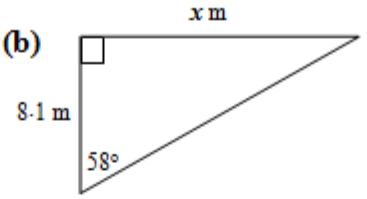
Trigonometry- Mix

4. Calculate the length of the side marked x in these right-angled triangles. You will have to choose which ratio to use.

(a)



(b)



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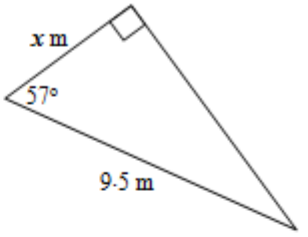

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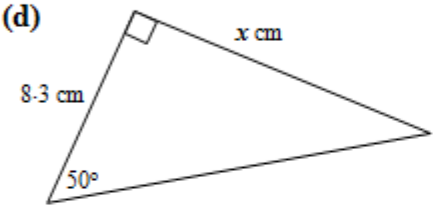

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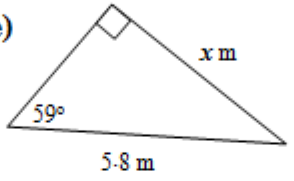

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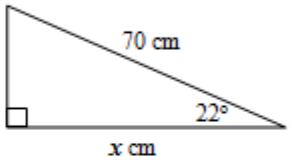

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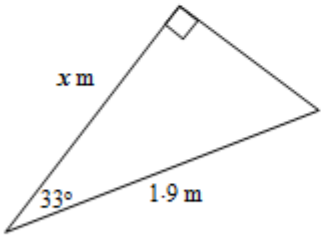

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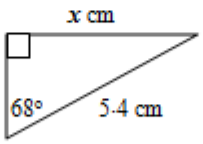

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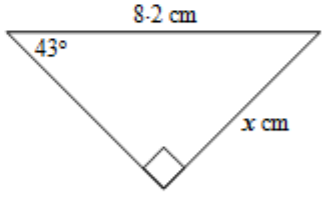

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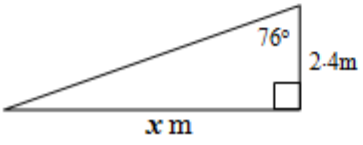

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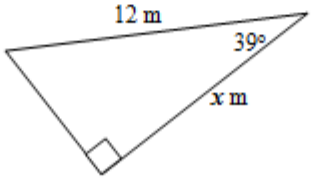

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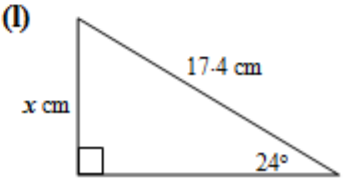
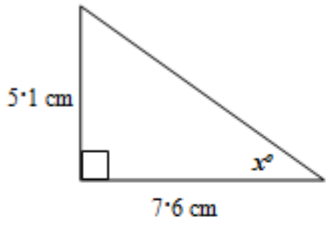


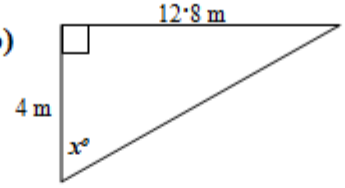
Trigonometry

1. Use the **Tangent** ratio to calculate the size of the angle marked x° in these right-angled triangles.

(a)



(b)



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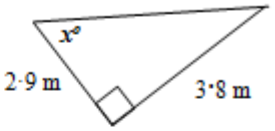

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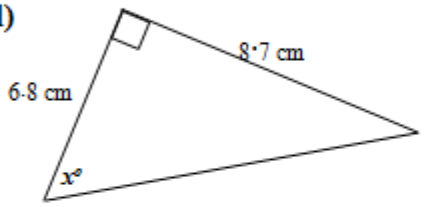

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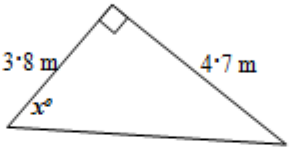

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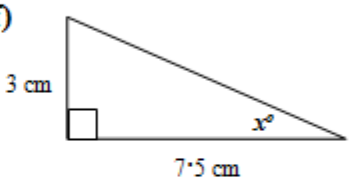

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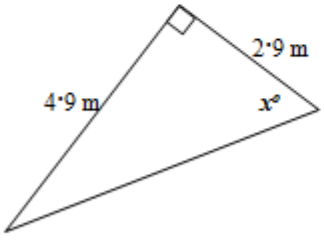

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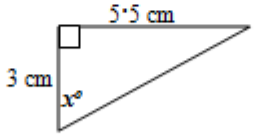

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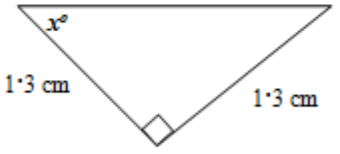

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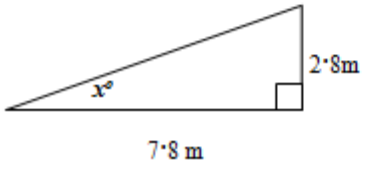

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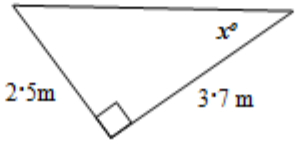

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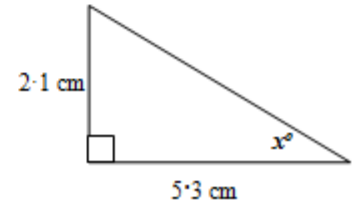
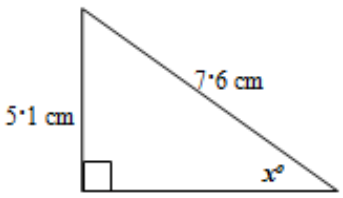


Trigonometry

2. Use the **Sine** ratio to calculate the size of the angle marked x^o in these right-angled triangles.

(a)



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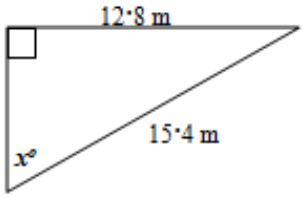

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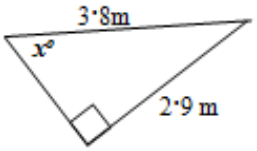

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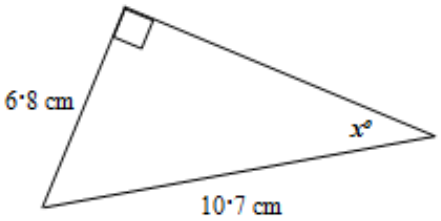

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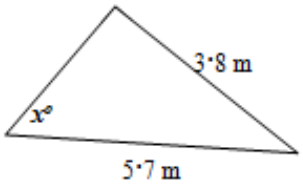

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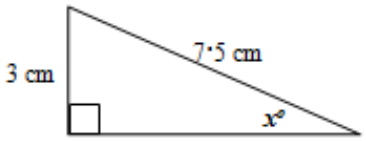
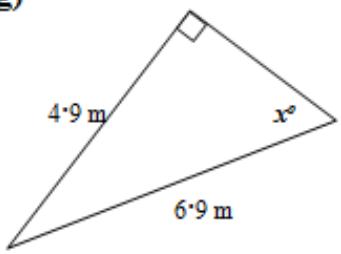
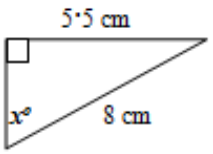


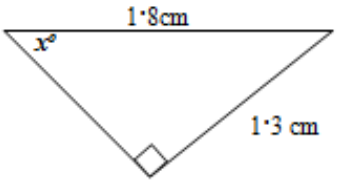
(g)



(h)



(i)



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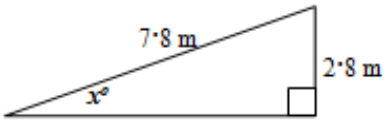

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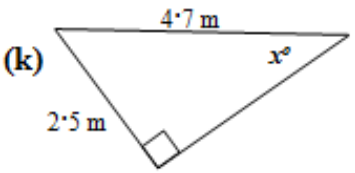

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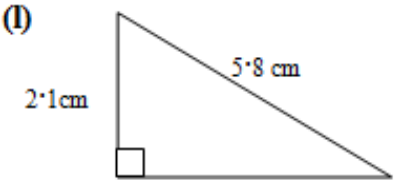
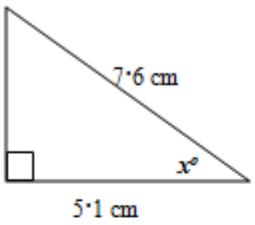


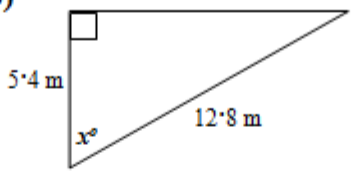
Trigonometry

3. Use the **Cosine** ratio to calculate the size of the angle marked x^o in these right-angled triangles.

(a)



(b)



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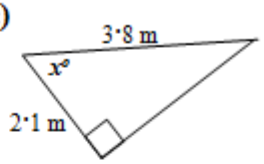

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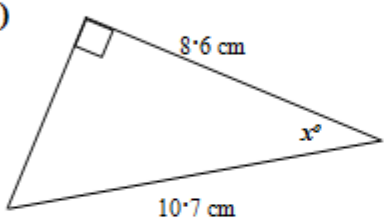
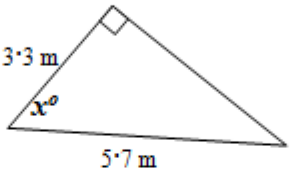


(e)



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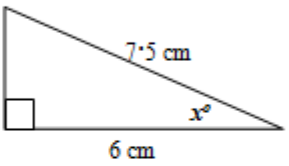
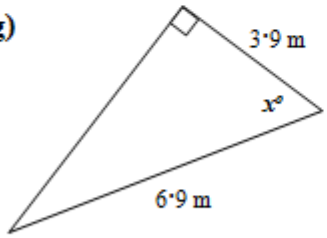


(g)



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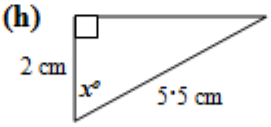

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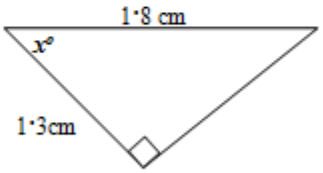

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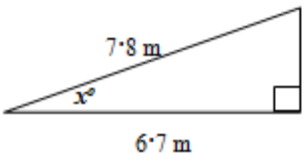

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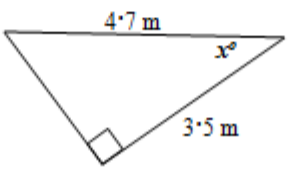

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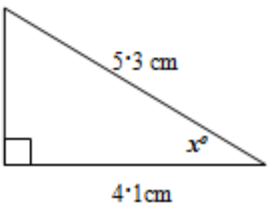
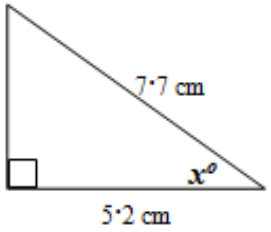


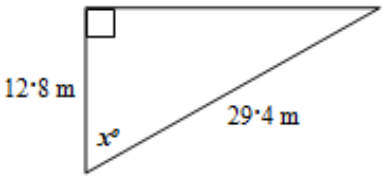
Trigonometry- Mix

4. Calculate the size of the angle marked x^o in these right-angled triangles. You will have to choose which ratio to use.

(a)



(b)



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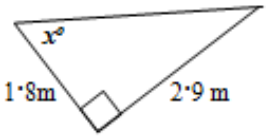
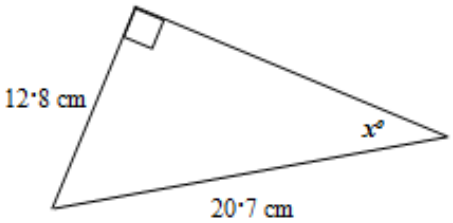


(d)



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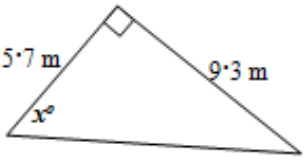

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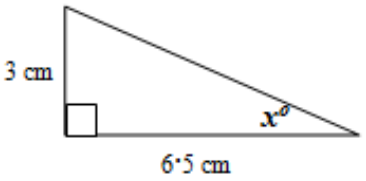

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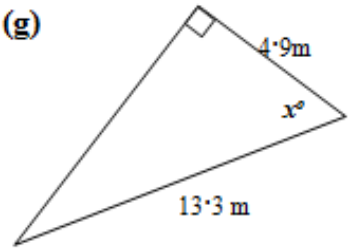

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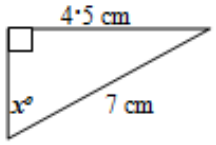
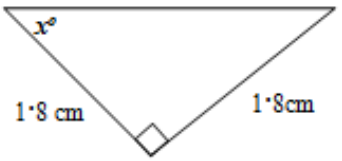
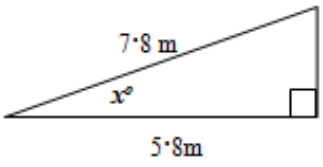


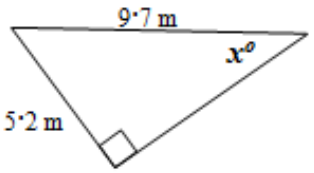
(i)



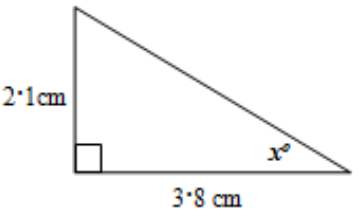
(j)



(k)



(l)



Trigonometry- Mix

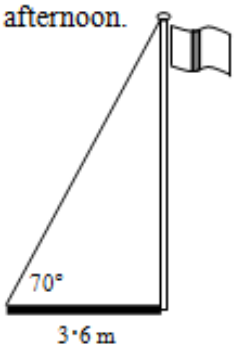
Problem Solving Examples

1. This diagram shows the shadow cast by a flagpole early in the afternoon.

The shadow's length is 3·6 metres.

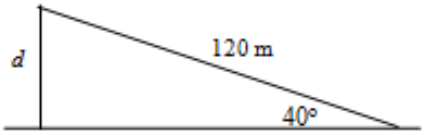
What is the height of the flagpole?

(Give your answer to 1 d.p.)



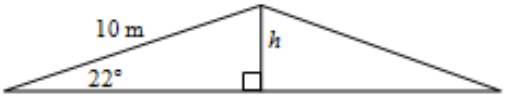
2. A 120 m long anchor holds a fishing boat in position. The line makes an angle of 40° with the sea floor.

How deep is the sea at this position?



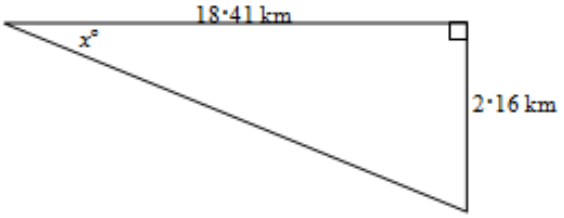
3. The diagram shows the symmetrical cross-section of a roof.

Find the height, h.



4. An aircraft making a steady descent decreases height by 2·16 km in 18·41 km.

What is the angle of descent, $x°$?



Answers Pt1

Calculating a side in a right-angled triangle

1.	**(a)**	1·9cm	**(b)**	6m	**(c)**	17m		
	(d)	3·9cm	**(e)**	4·6m	**(f)**	13·7cm		
	(g)	5m	**(h)**	9·2cm	**(i)**	4·9cm		
	(j)	5·4m	**(k)**	3·1m	**(l)**	1·3cm		
	(m)	17·7cm		**(e)** 5·8m		**(o)**	17·7mm	
2.	**(a)**	3cm	**(b)**	5·7m	**(c)**	14·5m		
	(d)	6cm	**(e)**	2·4m	**(f)**	24·3cm		
	(g)	1·5m	**(h)**	5·7cm	**(i)**	4·9cm		
	(j)	4·6m	**(k)**	6·3m	**(l)**	2·4cm		
	(m)	23·3cm	**(n)**	4·6m	**(o)**	5·5mm		
3.	**(a)**	3·7cm	**(b)**	3·1m	**(c)**	10·7m		
	(d)	5·7cm	**(e)**	1·6m	**(f)**	60·7cm		
	(g)	2·2m	**(h)**	2cm	**(i)**	4·8cm		
	(j)	2·8m	**(k)**	7·4m	**(l)**	6·9cm		
	(m)	42·4cm	**(n)**	7·2m	**(o)**	0·8mm		
4.	**(a)**	3·9cm	**(b)**	13m	**(c)**	5·2m		
	(d)	9·9cm	**(e)**	5m	**(f)**	64·9cm		
	(g)	1·6m	**(h)**	5cm	**(i)**	5·6cm		
	(j)	9·6m	**(k)**	9·3m	**(l)**	7·1cm		
	(m)	26·5cm	**(n)**	33·7m	**(o)**	83·7mm		

Answers Pt2

Applying Trigonometric Skills to Right-angled Triangles

Calculating an angle in a right-angled triangle

1.	(a)	33·9°	(b)	72·6°	(c)	52·7°
	(d)	52°	(e)	51°	(f)	21·8°
	(g)	59·4°	(h)	61·4°	(j)	45°
	(j)	19·7°	(k)	34°	(l)	21·6°
	(m)	38·8°	(n)	67·2°	(o)	16·2°

2.	(a)	42·1°	(b)	56·2°	(c)	49·7°
	(d)	39·5°	(e)	41·8°	(f)	23·6°
	(g)	45·2°	(h)	43·4°	(i)	46·2°
	(j)	21°	(k)	32·1°	(l)	21·2°
	(m)	26·7°	(n)	46·1°	(o)	27·5°
3.	(a)	47·9°	(b)	65°	(c)	56·5°
	(d)	36·5°	(e)	54·6°	(f)	36·9°
	(g)	55·6°	(h)	68·7°	(i)	43·8°
	(j)	30·8°	(k)	41·9°	(l)	39·3°
	(m)	36·7°	(n)	68·2°	(o)	44·1°
4.	(a)	47·5°	(b)	64·2°	(c)	58·1°
	(d)	38·2°	(e)	58·5°	(f)	24·8°
	(g)	68·4°	(h)	40°	(i)	45°
	(j)	42°	(k)	32·4°	(l)	28·9°
	(m)	27·1°	(n)	62°	(o)	33·4°

Applying Trigonometric Skills to Right-angled Triangles

Problem Solving Questions

1.	9·9 m	2.	77·1 m	3.	3·7 m	4.	6·7°