A Measurement: Working with solids (Pythagoras' theorem in 3 dimensions)   Skill 7.9
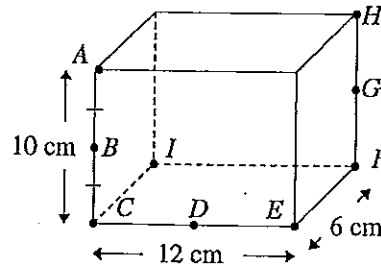
1 Find the lengths of these lines:

(a) *AD*   (b) *AE*   (c) *BD*
(d) *AH*   (e) *AF*   (f) *EG*
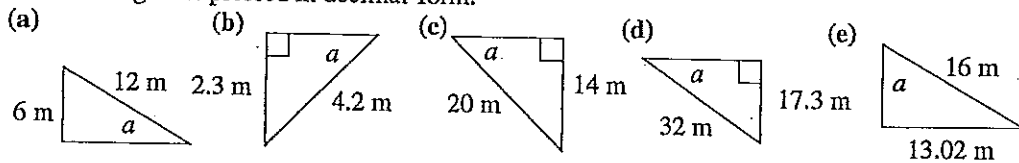(g) *EH*   (h) *EI*   (i) *GI*
(j) *BI*

10 cm

12 cm   6 cm

2 Find the longest pencil to fit inside a cylinder of height 12.5 cm and radius 3 cm.

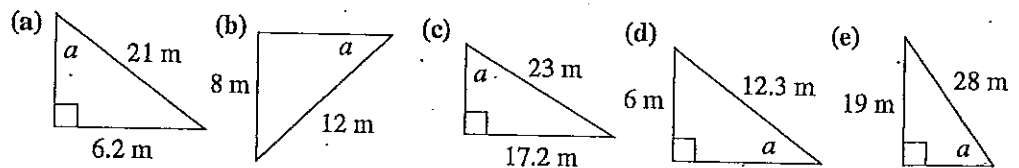3 Find the height of a cone whose slant edge is 20 cm and base diameter is 12 m.

B Trigonometry: Using sin to find angles   Skill 8.4

1 Find the angles expressed in decimal form:

(a) 6 m, 12 m, *a*   (b) 2.3 m, *a*, 4.2 m   (c) *a*, 20 m   (d) *a*, 14 m, 32 m   (e) *a*, 16 m, 13.02 m   17.3 m

2 Find the angles expressed in degree/minute form:

(a) *a*, 21 m, 6.2 m   (b) *a*, 8 m, 12 m   (c) *a*, 23 m, 17.2 m   (d) 6 m, 12.3 m, *a*   (e) 19 m, 28 m, *a*
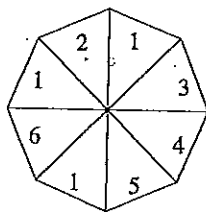
C Chance and data: Displaying sample spaces   Skill 9.9

Use a lattice diagram to display the sample space of:

1 Tossing a fair coin and rolling a die with numbers 7→ 12.

2 Spinning this spinner twice.

(spinner with numbers 2, 1, 1, 3, 6, 4, 1, 5)

D Chance and data: Probability of multiple independent events   Skill 9.10

A box contains 6 red and 7 blue balls. The balls is selected and its colour noted. It is then replaced and another taken out. What is the probability of selecting:

1 two red balls   2 two blue balls
3 red then blue in that order   4 red and blue or blue and red?

E Calculators: Repeating an operation on a range of numbers   Skill 10.3

Complete the following operations on this data set:

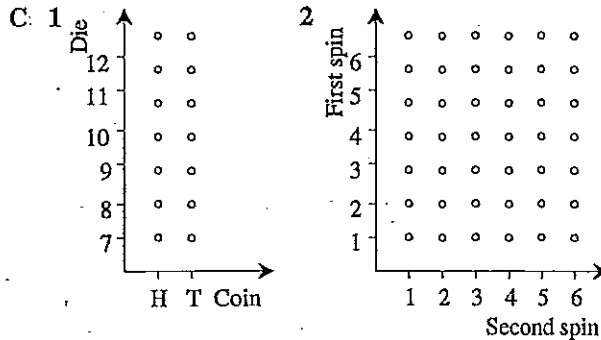{3.8, –4.2, 16, –2.8, 3.04, 1.2, 18.07, 3.9, 4.2, –3.2, 1.001, 6.3, –4.2, 17.3, 18.2, –3.8}

1 multiply them by –3   2 divide them by 0.2
3 add 3.12 to them   4 subtract 1.021 from them

A 1 (a) 11.66 cm (b) 15.62 cm (c) 7.81 cm
(d) 13.42 cm (e) 16.73 cm (f) 7.81 cm
(g) 11.66 cm (h) 13.42 cm (i) 13 cm
(j) 7.81 cm

2 13.87 cm   **3** 19.08 cm

B 1 (a) 30° (b) 33.20° (c) 44.43°
(d) 32.73° (e) 54.46°

2 (a) 17°10' (b) 41°49' (c) 48°24'
(d) 29°12' (e) 42°44'

C 1   **2**

D 1 $\left(\dfrac{6}{13}\right)^2 = \dfrac{36}{169}$ **2** $\left(\dfrac{7}{13}\right)^2 = \dfrac{49}{169}$

3 $\dfrac{6}{13} \times \dfrac{7}{13} = \dfrac{42}{169}$ **4** $2 \times \dfrac{6}{13} \times \dfrac{7}{13} = \dfrac{82}{169}$

E 1 −11.4, 12.6, −48, 8.4, −9.12, −3.6, −54.21, −11.7,
−12.6, 9.6, −3.003, −18.9, 12.6, −51.9, −54.6, 11.4

2 19, −21, 80, −14, 15.2, 6, 90.35, 19.5, 21, −16,
5.005, 31.5, −21, 86.5, 91, −19

3 6.92, −1.08, 19.12, 0.32, 6.16, 4.32, 21.19, 7.02,
7.32, −0.08, 4.121, 9.42, −1.08, 20.42, 21.32, −0.68

4 2.779, −5.221, 14.979, −3.821, 2.019, 0.179,
17.049, 2.879, 3.179, −4.221, −0.02, 5.279, −5.221,
16.279, 17.179, −4.821