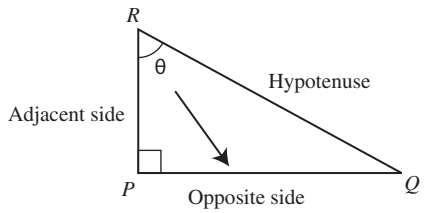
Fully-Worked Solutions

PRACTICE 5

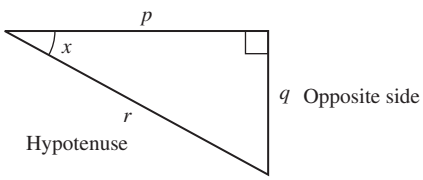
Section A

1



Answer: **B**

2

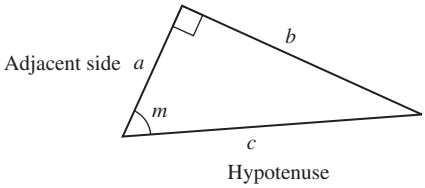


$\sin x = \dfrac{\text{Opposite side}}{\text{Hypotenuse}}$

$\sin x = \dfrac{q}{r}$

Answer: **C**

3

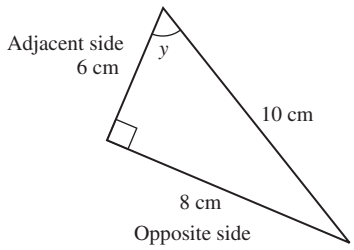


$\cos m = \dfrac{\text{Adjacent side}}{\text{Hypotenuse}}$

$\cos m = \dfrac{a}{c}$

Answer: **C**

4

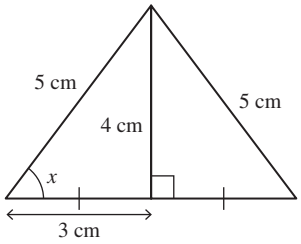


$\tan y = \dfrac{\text{Opposite side}}{\text{Adjacent side}}$

$\tan y = \dfrac{8}{6} = \dfrac{4}{3}$

Answer: **A**

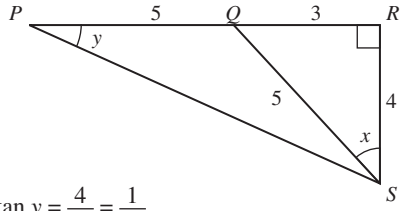
5



$\sin x = \dfrac{4}{5}$

Answer: **C**

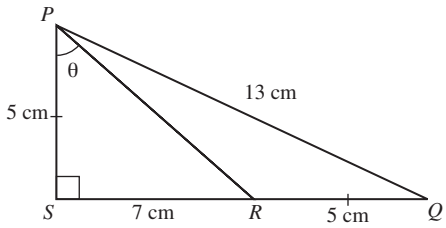
6



$\tan y = \dfrac{4}{8} = \dfrac{1}{2}$

Answer: **D**

7



$QS = \sqrt{13^2 - 5^2} = 12 \text{ cm}$

$SR = 7 \text{ cm}$

$\tan \theta = \dfrac{7}{5}$

Answer: **A**

8 $\tan \theta = \dfrac{12}{5}$

$\dfrac{24}{PQ} = \dfrac{12}{5}$

$12\,PQ = 120$

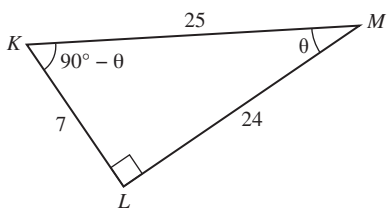
$PQ = 10 \text{ cm}$

$PR = \sqrt{24^2 + 10^2}$

$= 26 \text{ cm}$

Answer: **C**

9



$LM = \sqrt{25^2 - 7^2} = 24$

$\tan (90° - \theta) = \frac{24}{7}$

Answer: **D**

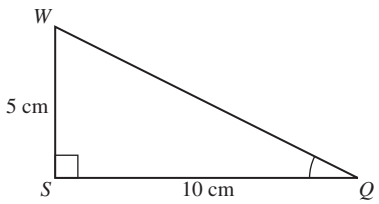
10 $\tan x = \frac{\sin x}{\cos x}$

$= \frac{\frac{3}{5}}{\frac{4}{5}}$

$= \frac{3}{4}$

Answer: **A**

11



$SQ = \sqrt{6^2 + 8^2}$

$= 10$ cm

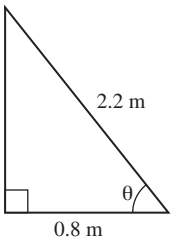
$\tan \angle WQS = \frac{5}{10}$

$\angle WQS = \tan^{-1} \frac{5}{10}$

$= 26.57°$

Answer: **B**

12



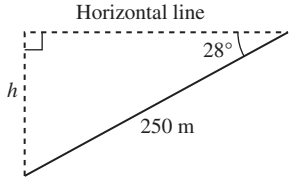
$\cos \theta = \frac{0.8}{2.2}$

$\theta = \cos^{-1} \frac{0.8}{2.2}$

$= 68°41'$

Answer: **C**

13



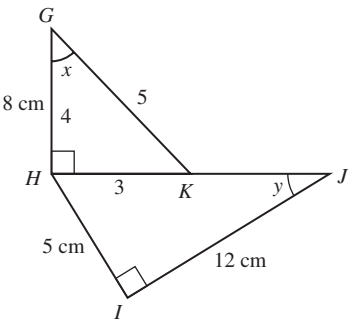
$\frac{h}{250} = \sin 28°$

$h = 250 \sin 28°$

$= 117.4$ m

Answer: **A**

14



$HK = 3 \times 2 = 6$ cm

$HJ = \sqrt{5^2 + 12^2}$

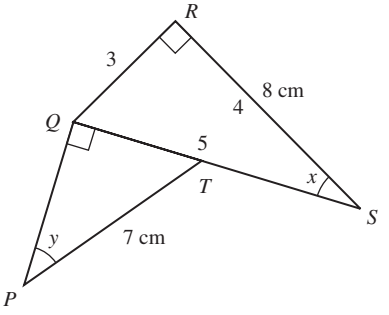
$= 13$ cm

$\therefore KJ = 13 - 6$

$= 7$ cm

Answer: **B**

15



$QS = 5 \times 2 = 10$ cm

$QT = \frac{1}{2} \times 10 \text{ cm} = 5 \text{ cm}$

$\sin y = \frac{5}{7}$

Answer: **A**

Section B

1 (a) (i) PR: Hypotenuse

(ii) PQ: Adjacent side

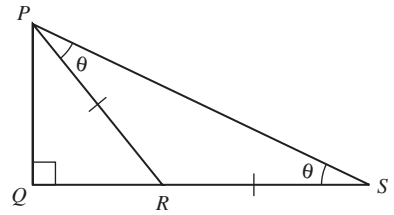
(b) (i) increases

(ii) decreases

2 (a) (i) FALSE

(ii) TRUE

(b)



$\sin \theta = \frac{PQ}{PS}$

3 (a) (i) $\sin 45° \boxed{=} \frac{1}{\sqrt{2}}$

(ii) $\tan 60° \boxed{\neq} \frac{\sqrt{3}}{2}$

(b) (i) $\cos \alpha = \frac{4}{5}$

(ii) $\tan \beta = \frac{8}{15}$

Section C

1 (a) $LN = \sqrt{13^2 - 5^2}$
$= 12$ cm

$MN = \frac{1}{2} \times LN$

$= \frac{1}{2} \times 12$ cm

$= 6$ cm

$\tan x = \frac{MN}{JN}$

$= \frac{6}{5}$

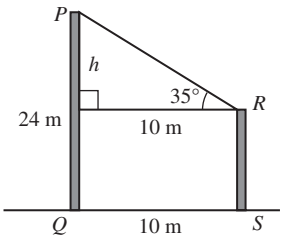
(b) $\angle BAC = 90° - x$
$\therefore \angle AED = x$

ΔADE, $\tan x = \frac{3}{4}$

$x = \tan^{-1} \frac{3}{4}$

$= 36.87°$ or $36°52'$

(c)



$\tan 35° = \frac{h}{10}$

$h = 10 \tan 35°$

$= 7$ m

$RS = 24 - 7$

$= 17$ m

2 (a) $\tan x = \frac{\sin x}{\cos x}$

$\cos x = \frac{\sin x}{\tan x}$

$= \frac{0.77}{1.2}$

$= 0.6417$

(b) (i) $\sin y = \frac{3}{5} = \frac{9 \text{ cm}}{CD}$

$3CD = 45$

$CD = 15$ cm

$AC = \sqrt{15^2 - 9^2} = 12$ cm

$\tan y = \frac{9}{12} = \frac{3}{4}$

(ii) $\cos x = \frac{5}{8} = \frac{AB}{AC}$

$\frac{5}{8} = \frac{AB}{AC}$

$AB = \frac{5}{8} \times 12$

$= 7.5$ cm

(c) (i) $AC = \sqrt{17^2 - 8^2} = 15$ cm

$\sin x = \frac{15}{17}$

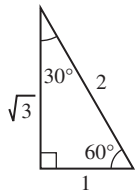
(ii) $AB = \sqrt{15^2 - 9^2}$

$= 12$ cm

3 (a) $\cos 30° + \sin 60°$

$= \frac{\sqrt{3}}{2} + \frac{\sqrt{3}}{2}$

$= \sqrt{3}$



(b) $\cos x = \frac{4}{5}$

$x = \cos^{-1} \frac{4}{5}$

$x = 36° 52'$

$\cos x = \frac{4}{5}$

$\frac{QS}{20} = \frac{4}{5}$

$QS = 16$ cm

$RS = \sqrt{13^2 - 12^2}$

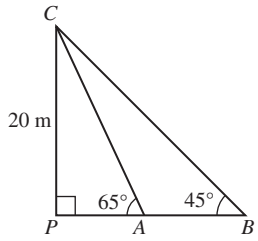
$= 5$ cm

$QR = QS - RS$

$= 16 - 5$

$= 11$ cm

(c)



$\tan 65° = \frac{20}{PA}$

$PA = \frac{20}{\tan 65°} = 9.326$ m

$\tan 45° = \frac{20}{PB}$

$PB = \frac{20}{\tan 65°} = 20$ m

$\therefore AB = PB - PA$

$= 20 - 9.326$

$= 10.674$ m