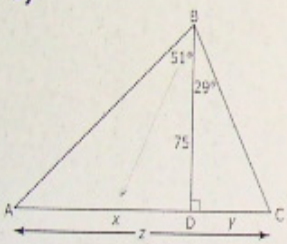
Name: _____ Date: _____

Trigonometry Extra Practice

1. For each diagram, determine the lengths of *x*, *y*, and *z* to the nearest whole unit.

a)



(i) $\tan 51° = \frac{x}{75}$

$1.2349 = \frac{x}{75}$

$x = 92.6$

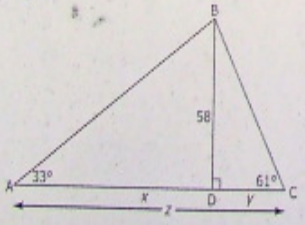
(ii) $\tan 29° = \frac{y}{75}$

$0.5543 = \frac{y}{75}$

$y = 41.6$

(iii) $z = 92.6 + 41.6 = 134.2$

b)



(i) $\tan 33° = \frac{58}{x}$

$0.6494 = \frac{58}{x}$

$0.6494x = 58$

$x = 89.3$

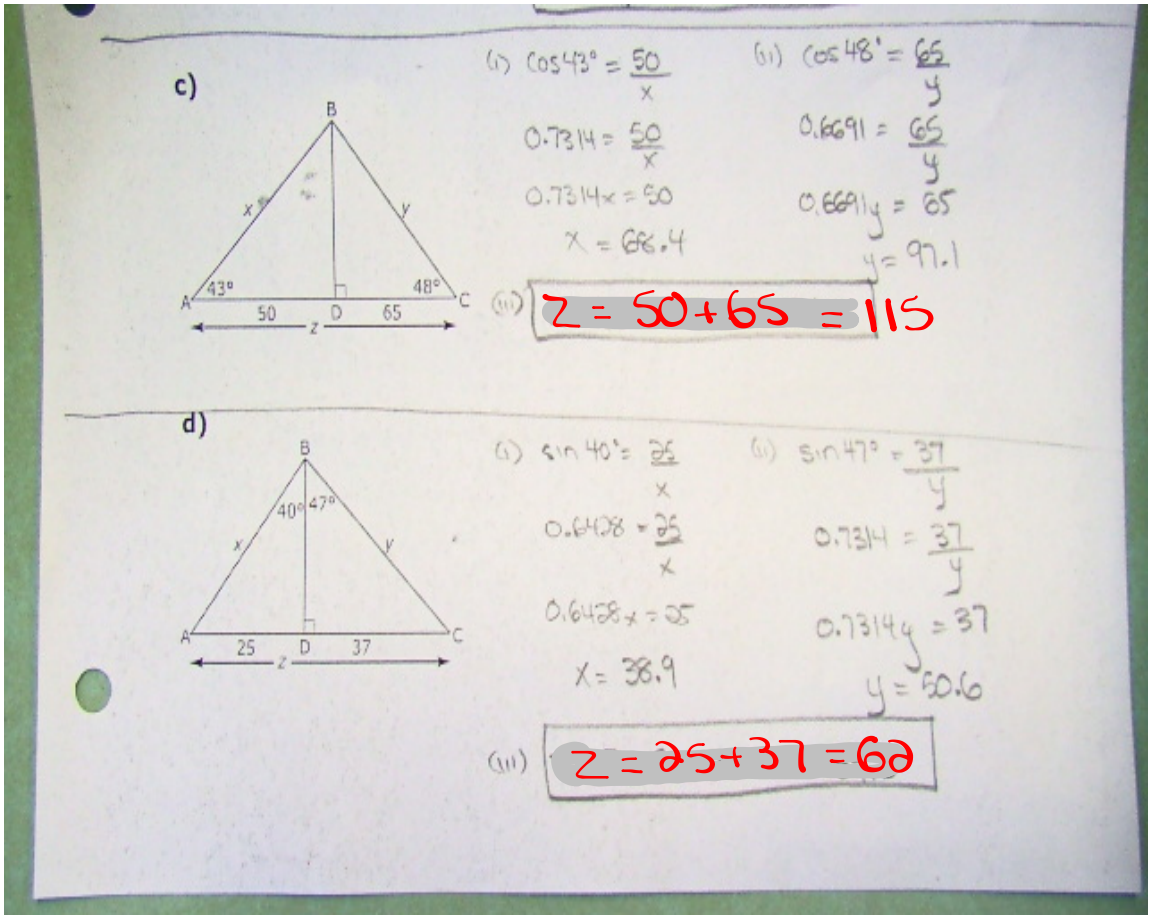
(ii) $\tan 61° = \frac{58}{y}$

$1.8040 = \frac{58}{y}$

$1.8049y = 58$

$y = 32.2$

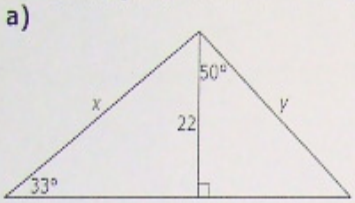
(iii) $z = 89.3 + 32.2 = 121.5$


c)
B
x
y
43°
48°
A
C
50
D
65
z
(i) cos 43° = 50/x
0.7314 = 50/x
0.7314x = 50
x = 68.4
(ii) cos 48° = 65/y
0.6691 = 65/y
0.6691y = 65
y = 97.1
(iii) z = 50 + 65 = 115
d)
B
40°
47°
x
y
A
C
25
D
37
z
(i) sin 40° = 25/x
0.6428 = 25/x
0.6428x = 25
x = 38.9
(ii) sin 47° = 37/y
0.7314 = 37/y
0.7314y = 37
y = 50.6
(iii) z = 25 + 37 = 62

Name: _____ Date: _____

2. For each diagram, determine the lengths of sides x and y to the nearest whole unit.

a)



(i) $\sin 33° = \frac{22}{x}$

$0.5446 = \frac{22}{x}$

$0.5446x = 22$

$x = 40.4$

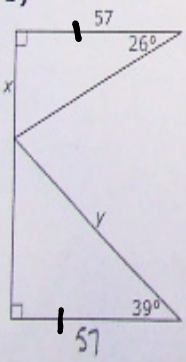
(ii) $\cos 50° = \frac{22}{y}$

$0.6428 = \frac{22}{y}$

$0.6428y = 22$

$y = 34.2$

b)



(i) $\tan 26° = \frac{x}{57}$

$0.4877 = \frac{x}{57}$

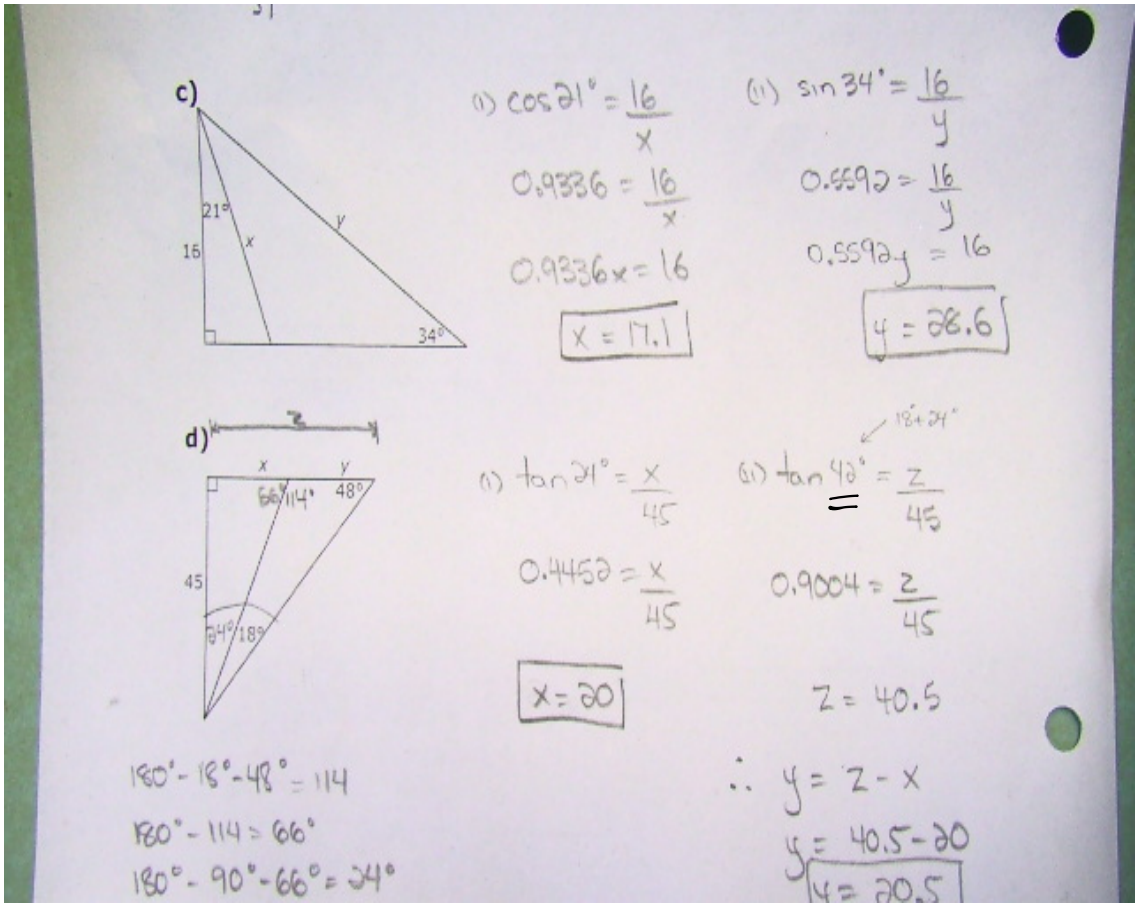
$x = 27.8$

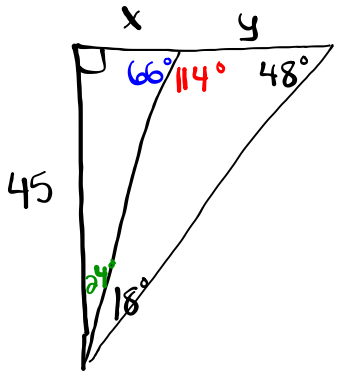
(ii) $\cos 39° = \frac{57}{y}$

$0.7771 = \frac{57}{y}$

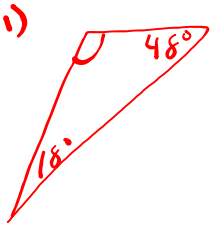
$0.7771y = 57$

$y = 73.3$


c)
21°
x
y
16
34°
(i) cos 21° = 16/x
0.9336 = 16/x
0.9336x = 16
x = 17.1
(ii) sin 34° = 16/y
0.5592 = 16/y
0.5592y = 16
y = 28.6
d)
z
x
y
66°/114°
48°
45
24°/18°
(i) tan 21° = x/45
0.4452 = x/45
x = 20
(ii) tan 42° = z/45
18°+24°
0.9004 = z/45
z = 40.5
180° - 18° - 48° = 114
180° - 114 = 66°
180° - 90° - 66° = 24°
∴ y = z - x
y = 40.5 - 20
y = 20.5

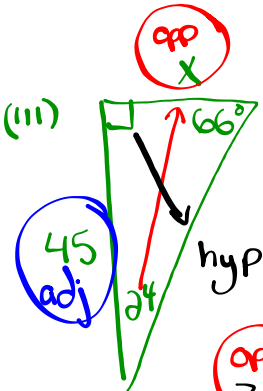


(i)



$180° - 48° - 18°$
$= 114°$

(ii) $180° - 114° = 66°$



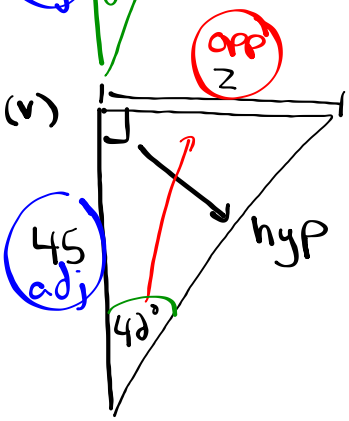
(iii) $180° - 90° - 66°$
$= 24°$

(iv) $\tan\theta = \frac{opp}{adj}$

$\tan 24° = \frac{x}{45}$

$0.4459 = \frac{x}{45}$

$20 = x$



(v) $\tan\theta = \frac{opp}{adj}$

$\tan 49° = \frac{z}{45}$

$0.9004 = \frac{z}{45}$

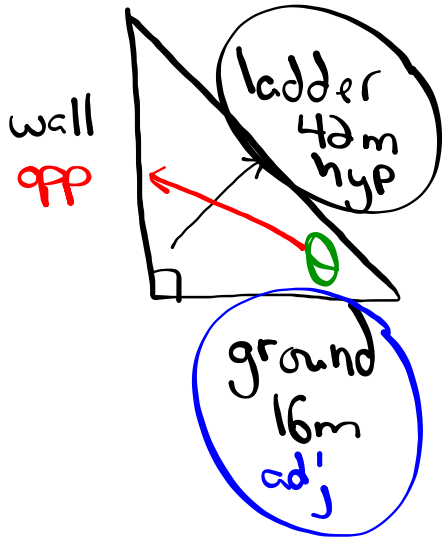
$40.5 = z$

(vi) $y = z - x$

$y = 40.5 - 20$

$y = 20.5$

1. A 42m ladder leans against a wall. The bottom of the ladder is 16m from the base of the wall. What angle does the ladder make with the ground?



$\cos\theta = \frac{adj}{hyp}$

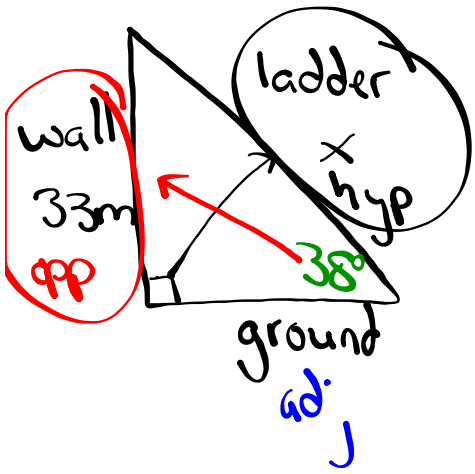
$\cos\theta = \frac{16}{42}$

$\cos\theta = 0.3809$

$\theta = \cos^{-1}(0.3809)$

$\theta = 68°$

2. A ladder is leaned against a wall and makes a 38° angle with the ground. If the ladder reaches 33m up the wall, how long is the ladder?



$$\sin\theta = \frac{opp}{hyp}$$

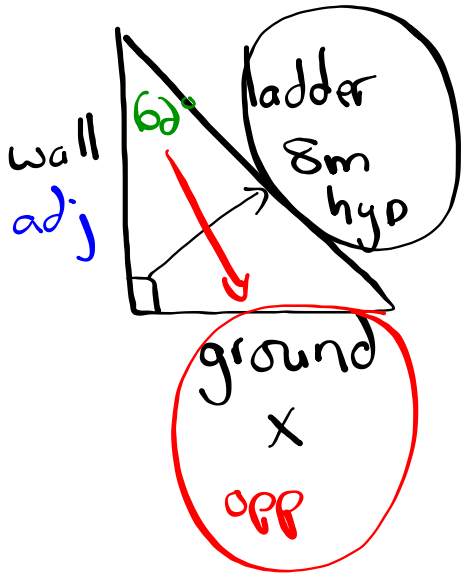
$$\sin 38^\circ = \frac{33}{x}$$

$$x \cdot 0.6157 = \frac{33}{x} \cdot x$$

$$\frac{0.6157x}{0.6157} = \frac{33}{0.6157}$$

$$x = 53.6\text{m}$$

3. An 8m ladder makes an angle of 62° with the wall. How far is the bottom of the ladder from the base of the building?



$\sin\theta = \frac{opp}{hyp}$

$\sin 62^\circ = \frac{x}{8}$

$8 \cdot 0.8829 = \frac{x}{8} \cdot 8$

$7.1m = x$

Homework

#2, 3, 7-11

Answers:

② 1.4 km

③ 9.3 m

⑦ a) $\theta = 39°$

b) $\theta = 81°$

⑧ 31.6m

⑨ 15.9m

⑩ $\theta = 34°$

⑪ $\theta = 13°$