

SECTION 1.1 EXERCISES

1. Specify the measure of the angle in degrees using the correct algebraic sign.

Q 1. $\frac{1}{2}$ rotation counterclockwise

$$\frac{1}{2}(360^\circ) = 180^\circ$$

$$\frac{1}{2}(2\pi) = \pi$$

Q 3. $\frac{1}{3}(360^\circ) = -120^\circ$

$$\frac{1}{3}(-2\pi) = -\frac{2}{3}\pi$$

Q 7. $\frac{4}{5}$ rotation clockwise

$$\frac{4}{5}(-360^\circ) = -288^\circ$$

$$\frac{4}{5}(-2\pi) = -\frac{8}{5}\pi$$

Q 11.

a) Complement

$$90^\circ - 42^\circ = 48^\circ$$

b) Supplement of 42°

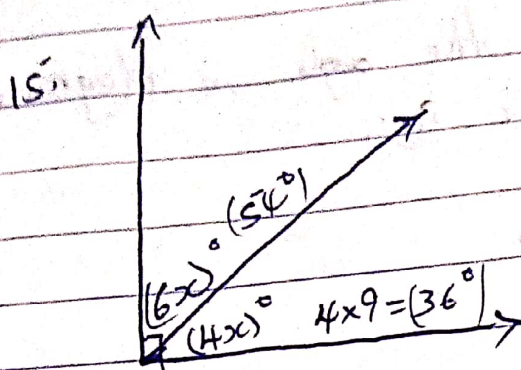
$$180 - 42 = 138^\circ$$

Q 13) a) Complement

$$90^\circ - 89^\circ = 1^\circ$$

b) Supplement

$$180 - 89 = 91^\circ$$



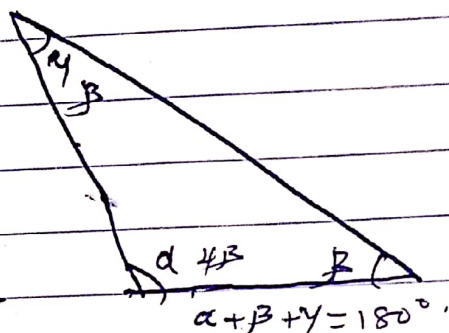
$$6x + 4x = 90^\circ$$

$$\frac{10x}{10} = \frac{90}{10} \quad x = 9$$

$$6x = 6 \times 9 = 54^\circ$$

$$4x = 4 \times 9 = 36^\circ$$

21.



If $\gamma = \beta$ and $\alpha = 4\beta$, find all the three angles.

If $\alpha + \beta + \gamma = 180^\circ$ & $\gamma = \beta$

$$\beta + 4\beta + \beta = 180^\circ$$

$$6\beta = 180^\circ$$

$$\beta = 30^\circ$$

$$\gamma = 30^\circ$$

$$\alpha = 120^\circ$$

23. If $\beta = 53.3^\circ$ and $\gamma = 23.6^\circ$, find α

$$53.3^\circ + 23.6^\circ + \alpha = 180^\circ$$

$$53.3^\circ + 23.6^\circ = 180^\circ - \alpha$$

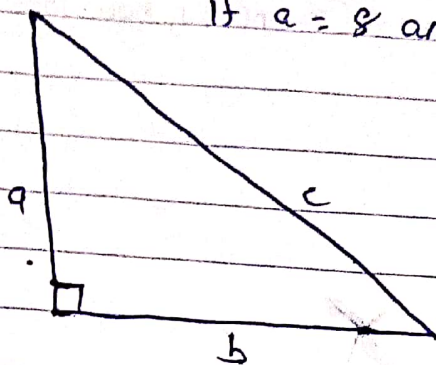
$$76.9^\circ = 180^\circ - \alpha$$

$$\alpha = 180^\circ - 76.9^\circ = 103.1^\circ$$

$$\alpha = 103.1^\circ$$

29.

If $a = 8$ and $b = 5$ find c .



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

$$8^2 + 5^2 = c^2$$

$$64 + 25 = c^2$$

$$89 = c^2$$

$$c = 9.43$$

31. If $a = 7$ and $c = 11$, find b .

$$7^2 + b^2 = 11^2$$

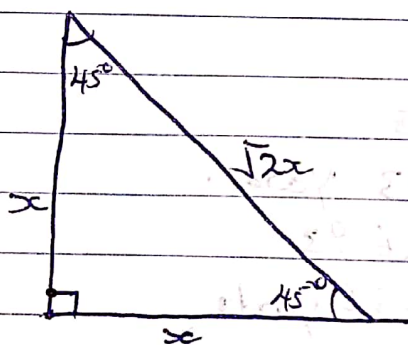
$$b^2 = 11^2 - 7^2$$

$$b^2 = 121 - 49$$

$$b^2 = 72$$

$$b = 8.49$$

37.



If the hypotenuse has length $2\sqrt{2}$ centimeters, how long is each leg?

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

$$x^2 + x^2 = (\sqrt{2}x)^2$$

but $\sqrt{2}x = 2\sqrt{2}$

$$\cancel{\sqrt{2}}x \cdot \sqrt{x} = \cancel{\sqrt{2}} \times \sqrt{4}$$

$$\sqrt{x} = \sqrt{4}$$

$$x = 2 \text{ inches}$$

39. If each leg has length $4\sqrt{2}$ inches, how long is the hypotenuse?

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

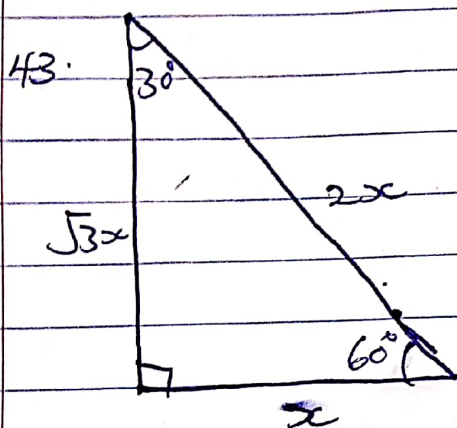
$$(4\sqrt{2})^2 + (4\sqrt{2})^2 = c^2$$

$$32 + 32 = c^2$$

$$64 = c^2$$

$$c = 8 \text{ inches}$$

Hypotenuse = ~~8~~ 8 inches



If the longer leg has 12 yards, what are the lengths of the other leg and the hypotenuse?

$$(\sqrt{3}x)^2 = (12)^2$$

$$\frac{3x^2}{3} = \frac{144}{3}$$

$$x^2 = 48$$

$$x = 6.93 \text{ yards}$$

$$\begin{aligned} \text{Hypotenuse} &= 2(x) = 2 \times 6.93 \\ &= 13.86 \text{ yards} \end{aligned}$$

45. If the hypotenuse has length 10 inches, what are the lengths of the two sides?

$$2x = 10 \text{ inches}$$

$$x = 5 \text{ inches}$$

$$\begin{aligned} \text{longer leg} &= \sqrt{3} \times 5 \\ &= 8.66 \text{ inches} \end{aligned}$$