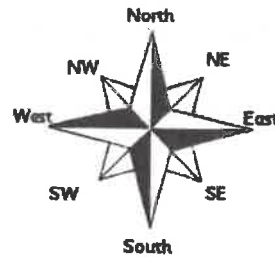


Angles and Trigonometry

KEY

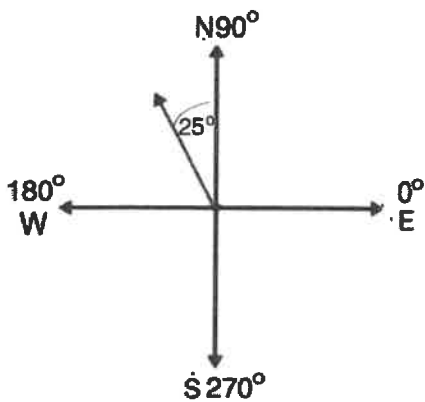
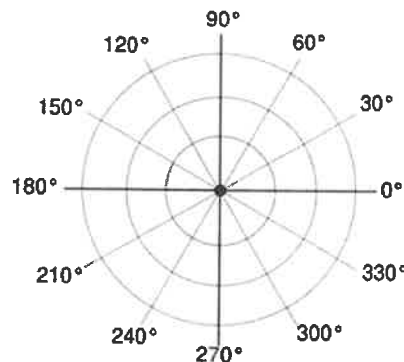
Compass Directions:

1. Identify if the arrow is pointing either north or south.
2. Determine the angle between the north-south line and the arrow.
3. Identify if the arrow is pointing east or west.

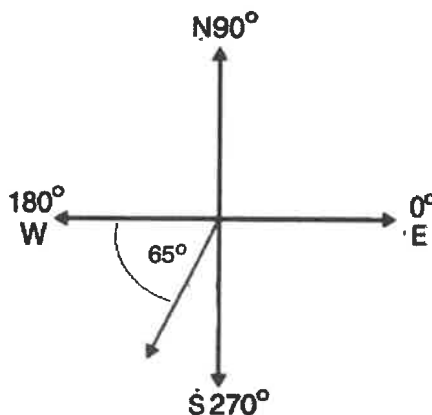


Coordinate Directions:

1. Starting with 0° to the east direction, determine how many degrees the arrow is rotated counter-clockwise.



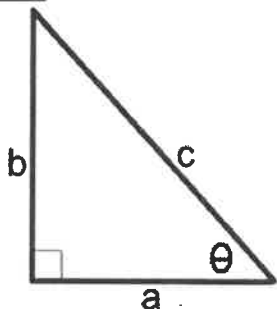
Compass: N25°W
 Coordinate: 115°



Compass: S25°W
 Coordinate: 245°

Trigonometry

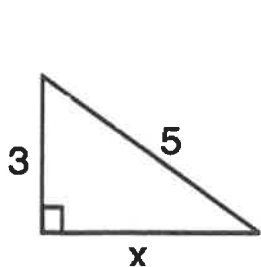
$$a^2 + b^2 = c^2$$



$$\sin \theta = \frac{b}{c}$$

$$\cos \theta = \frac{a}{c}$$

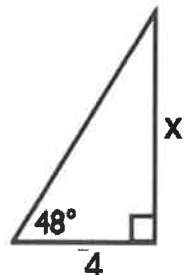
$$\tan \theta = \frac{b}{a}$$



$$x^2 + 3^2 = 5^2$$

$$x = \sqrt{5^2 - 3^2}$$

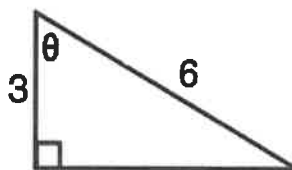
$$x = 4$$



$$\tan 48^\circ = \frac{x}{4}$$

$$x = 4 \tan 48^\circ$$

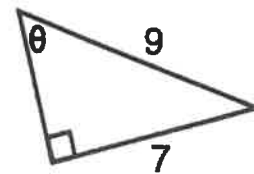
$$= 4.4$$



$$\cos \theta = \frac{3}{6}$$

$$\theta = \cos^{-1}\left(\frac{3}{6}\right)$$

$$= 60^\circ$$



$$\sin \theta = \frac{7}{9}$$

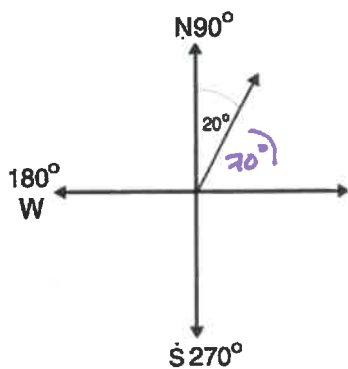
$$\theta = \sin^{-1}\left(\frac{7}{9}\right)$$

$$= 51^\circ$$

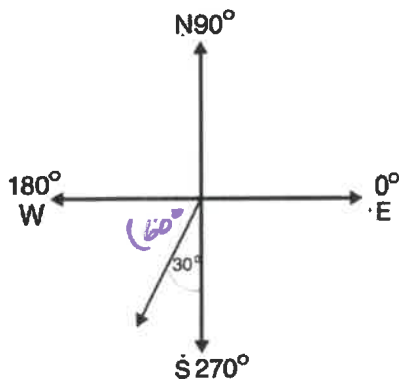
Directions and Trigonometry Worksheet

Name: _____ Block: _____

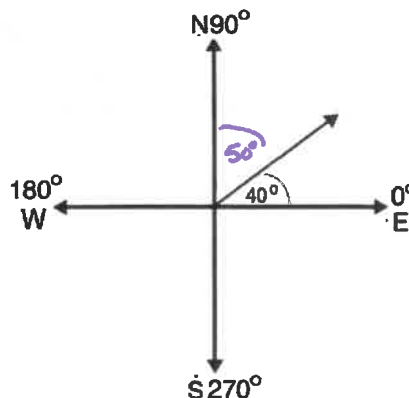
Identify the direction of the arrow in both compass points and the coordinate plane.



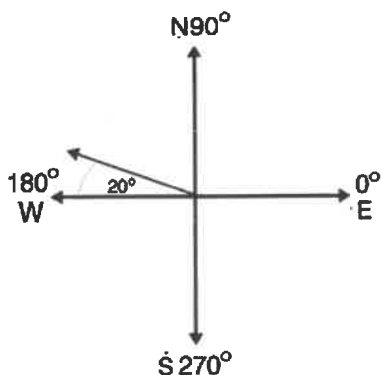
Compass: N20°E
Coordinate: 70°



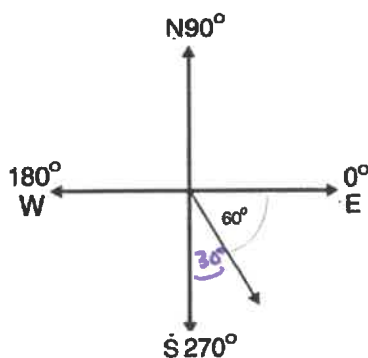
Compass: S30°W
Coordinate: 240°



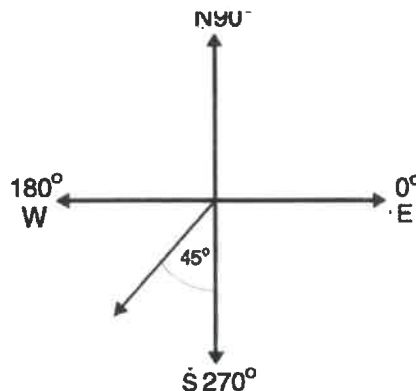
Compass: N50°E
Coordinate: 40°



Compass: N70°W
Coordinate: 160°

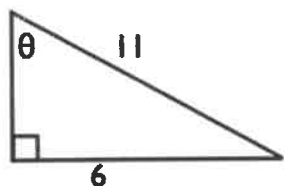


Compass: S30°E
Coordinate: 300°

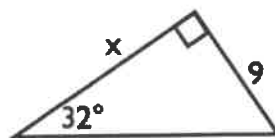


Compass: S45°W
Coordinate: 225°

Solve for either "x" or θ . Triangles are not to scale.

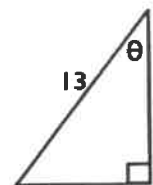


$$\theta = \sin^{-1}\left(\frac{6}{11}\right) = 33^\circ$$



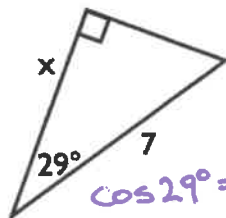
$$\tan 32^\circ = \frac{9}{x}$$

$$x = \frac{9}{\tan 32^\circ} = 14^\circ$$



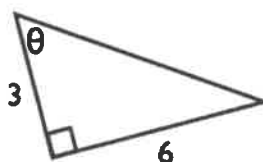
$$\cos \theta = \frac{9}{13}$$

$$\theta = \cos^{-1}\left(\frac{9}{13}\right) = 46^\circ$$

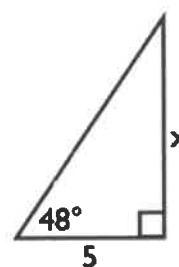


$$\cos 29^\circ = \frac{x}{7}$$

$$x = 7 \cos 29^\circ = 6.1$$



$$\theta = \tan^{-1}\left(\frac{6}{3}\right) = 63^\circ$$



$$\tan 48^\circ = \frac{x}{5}$$

$$x = 5 \tan 48^\circ = 5.6$$

REVIEW

Chapter **2**

EXAMPLE

Rewriting Equations

Solve the following equation for r .

$$\frac{q}{m} = \frac{2V}{B^2 r^2}$$

Multiply both sides of the equation by $mB^2 r^2$.

$$qB^2 r^2 = 2Vm$$

Divide both sides by qB^2 .

$$r^2 = \frac{2Vm}{qB^2}$$

Take the square root of both sides.

$$r = \sqrt{\frac{2Vm}{qB^2}} = \frac{1}{B} \sqrt{\frac{2Vm}{q}}$$

#3. $\frac{1}{d_o} = \frac{1}{f} - \frac{1}{d_i}$

$\frac{1}{d_o} = \frac{d_i}{d_i f} - \frac{f}{d_i f}$

$\frac{1}{d_o} = \frac{d_i - f}{d_i f}$

$d_o = \frac{d_i f}{d_i - f}$

Problems

Solve the following equations for the variable(s) requested.

1. $E = 1/2 mv^2$ for m and v .

$m = \frac{2E}{v^2}$ $v = \sqrt{\frac{2E}{m}}$

5. $P = \frac{Fd}{t}$ for d

$d = \frac{Pt}{F}$

2. $E = mgh$ for h

$h = \frac{E}{mg}$

6. $E = hf - W_o$ for W_o and h

$W_o = E + hf$
or $W_o = hf - E$

$h = \frac{E + W_o}{f}$

7. $\frac{r}{n^2} = \frac{h^2}{4\pi^2 kmq^2}$ for q

$q^2 = \frac{h^2 n^2}{4\pi^2 kmr}$

$q = \frac{hn}{2\pi\sqrt{kmr}}$

* 3. $\frac{1}{f} = \frac{1}{d_o} + \frac{1}{d_i}$ for d_o

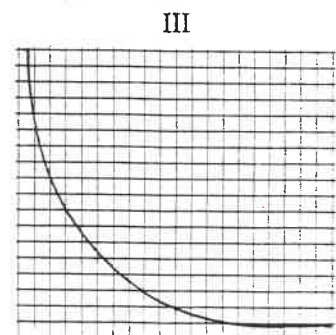
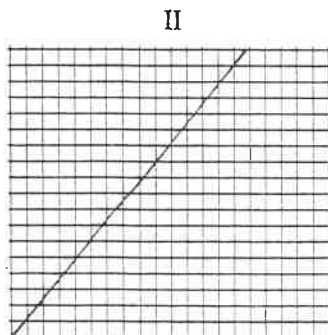
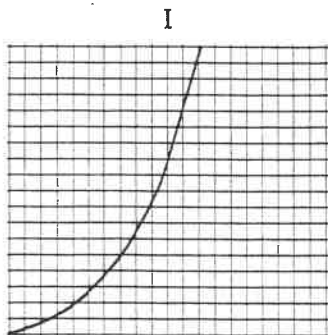
See solution on top right

$\frac{1}{d_o} = \frac{1}{f} - \frac{1}{d_i}$

4. $\frac{s_o}{s_i} = \frac{d_o}{d_i}$ for s_i

$s_i = \frac{s_o d_i}{d_o}$

8. Answer the questions on the next page about the graphs below.



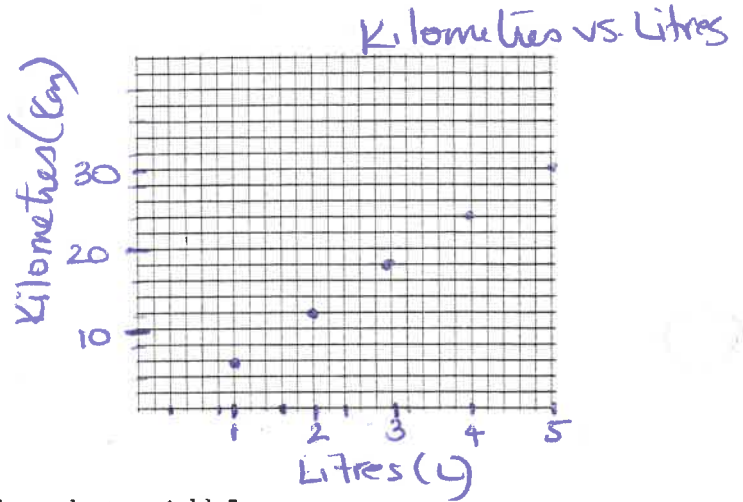
Write the general equation for each graph.

- I $y = kx^2$
 II $y = mx + b$
 III $y = \frac{k}{x}$

- II a. Which graph indicates y is directly proportional to x?
III b. Which graph indicates y is inversely proportional to x?
I c. Which graph indicates y is proportional to the square of x?

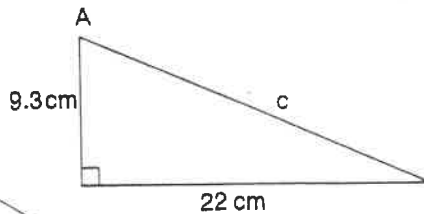
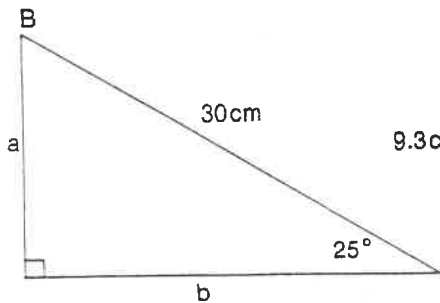
9. A car was designed so that each time one liter of gasoline was used, a light would flash on and the driver would then read the number of kilometers traveled. The data are given below. Make a graph and answer the questions about the graph.

Liters	Kilometers
1	6
2	12
3	18
4	24
5	30



- litres a. Which is the independent variable?
6 km/L b. What is the slope of the line?
9 km c. What distance would be expected for 1.5 liters?
Interpolation d. Reading between data points is called ____ .
36 e. What distance would you expect for 6 liters?
Extrapolation f. Reading beyond the data points is called ____ .

10. Solve the following triangles for the information requested.



$B = 65^\circ$
 $a = \sin 25^\circ = \frac{a}{30}$ $a = 30 \sin 25^\circ = 12.68 = 13 \text{ cm}$
 $b = \cos 25^\circ = \frac{b}{30}$ $b = 30 \cos 25^\circ = 27 \text{ cm}$
 $c = \sqrt{9.3^2 + 22^2} = 24 \text{ cm}$
 $A = \tan A = \frac{22}{9.3}$ $A = 72^\circ$