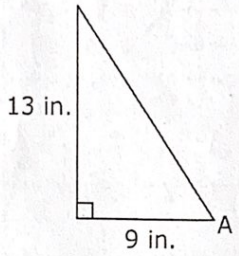
Name: _____ Date: _ Key _____

Section 6.2 Assignment

1. Determine the tangent ratio and measure of ∠A in each triangle.

a)

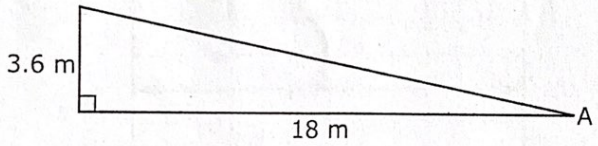


$\tan A = \frac{13}{9}$

$= \tan^{-1}(1.4444)$

$= 55^\circ$

b)

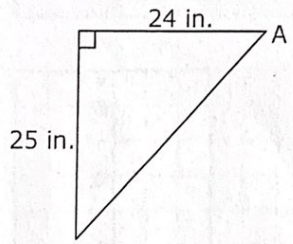


$\tan A = \frac{3.6}{18}$

$= \tan^{-1}(0.2)$

$= 11^\circ$

c)



$\tan A = \frac{25}{24}$

$\tan^{-1}(1.0417)$

$= 46^\circ$

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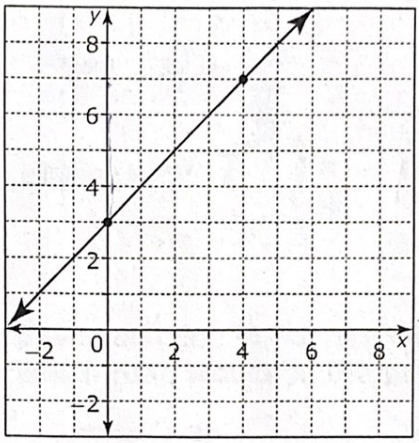
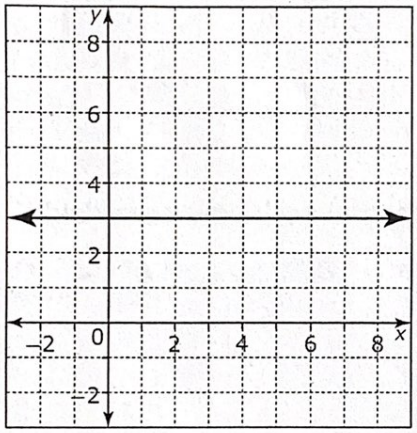
2. Determine the slope of each line.

a)



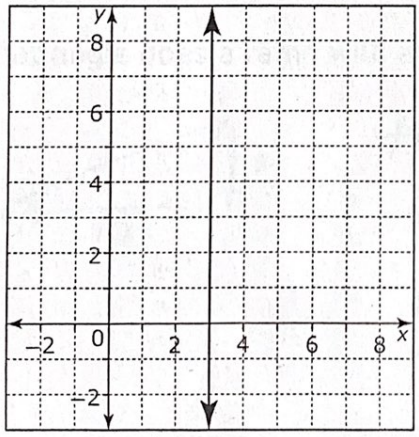
$\frac{4}{4} = 1$

b)



0

c)



undefined

3

3. For each graph in #2, determine the measure of the angle of elevation. Express each answer to the nearest degree.

a) $\tan A = \frac{4}{4}$

$= \tan^{-1}(1)$

$= 45^\circ$

b) 0

c) undefined or 90°

4. Suppose each line in #2 represents a road.

a) Which road would be the easiest to travel?

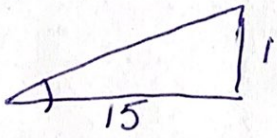
b - flat

b) Which road would be impossible to travel? Why?

C - straight up & down

5. What angle does a ramp with a slope of 1:15 make with the ground?

rise : run



$\tan\theta = \frac{1}{15}$

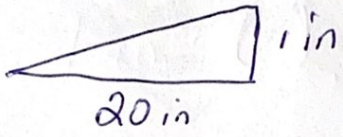
$\tan^{-1}(0.0667)$

$= 4^\circ$

6

6. A ramp has a steepness of 1 in. for every 20 in. of run.

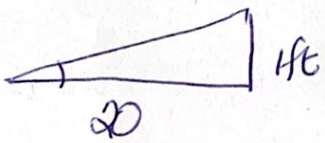
a) For the ramp to rise 1 ft, how far along the ground should it be?



$\frac{1 \text{ in}}{20 \text{ in}} = \frac{1 \text{ ft}}{20 \text{ ft}}$

or 240 inches

b) What is the angle of elevation of the ramp?



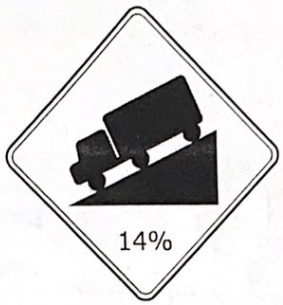
$\tan\theta = \frac{1}{20}$

$\tan^{-1}(0.05)$

$= 3^\circ$

/2

7. a) Explain the meaning of the sign shown.



14% slope (14 units of drop for 100 units of run horizontally)

b) Write the slope of the road as a fraction.

$\frac{14}{100} = \frac{7}{50}$

8. Determine the angle of elevation of a road with each grade. Express your answers to the nearest degree.

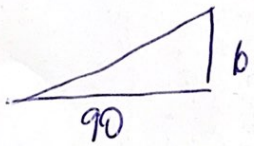
a) 10% $\tan\theta = \frac{10}{100} \rightarrow \tan^{-1}(0.1) = 6°$

b) 3% $\tan\theta = \frac{3}{100} \rightarrow \tan^{-1}(0.03) = 2°$

c) 8% $\tan\theta = \frac{8}{100} \rightarrow \tan^{-1}(0.08) = 5°$

d) 25% $\tan\theta = \frac{25}{100} \rightarrow \tan^{-1}(0.25) = 14°$

9. A driveway rises 6 inches over 90 inches along the ground. What is the grade of the driveway?



$\frac{6}{90} = 7\%$

10. The table shows details of the grades of roads. Complete the table. Express slope as a decimal to the nearest hundredth.

Road	Rise	Run	Slope as a Fraction	Slope as a Decimal	Percent Grade	
Atlantic Avenue	200	1000	$\frac{200}{1000} = \frac{1}{5}$	0.20	20%	a)
Bay Bypass	6	50	$\frac{6}{50} = \frac{3}{25}$	0.12	12%	b)
City Crescent	23	80	$\frac{23}{80}$	0.29	29%	c)
Downtown Drive	2	25	$\frac{2}{25}$	0.08	8%	d)
Harbour Highway	9	100	$\frac{9}{100}$	0.09	9%	e)
Rural Road	20	100	$\frac{20}{100}$	0.2	20%	f)
Suburb Speedway	2	100	$\frac{2}{100}$	0.02	2%	g)
Tickle Trail	7.5 or 75	100 1000	$\frac{7.5}{100}$	0.075	7.5%	h)

11. Refer to the table you completed in #10.

a) Which roads require a warning sign? (anything over 6%)

all except for g.

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b) ~~Which roads could not exist because the grades are so steep?~~

omit