

GRADE 9 MATH
EXAM REVIEW

Complete this review for 3% bonus on your exam!

Complete the review AND correct it for 6% bonus on your exam!

**The answers will be posted online at:
www.burnspvw.weebly.com at the end of the review week.**

Name: Key-

Expressions + Equations

1) Evaluate each expression:

$$a = 24$$

$$b = 2$$

$$34 - b = \underline{10}$$

$$\frac{a}{3} = \underline{8}$$

$$9b = \underline{18}$$

$$a + b = \underline{26}$$

$$2a = \underline{48}$$

$$\frac{24}{a} = \underline{1}$$



2) Rewrite each phrase as an algebraic expression:

subtract 7 from c $\underline{c - 7}$

30 divided by d $\underline{\frac{30}{d}}$

the product of 5 and e $\underline{5e}$

the sum of 8 and f $\underline{8 + f}$

3) Rewrite each algebraic expression as a phrase:

$e + 5 = 20$ the sum of e and 5 is twenty.

$6 - 7 = a$ the difference of 6 and 7 is a.

$4b = 400$ the product of 4 and b is four hundred

4) Complete the following table:

$\frac{40}{r} = s$					
r	2	4	5	8	40
s	20	10	8	5	1

5) Find what number each letter is in the following expressions:

$\begin{array}{r} 15 + g = 25 \\ -15 \quad -15 \\ \hline g = 10 \end{array}$	$\begin{array}{r} 150 - a = 10 \\ -150 \quad -150 \\ \hline a = 140 \end{array}$	$\begin{array}{r} 11 + d = 22 \\ -11 \quad -11 \\ \hline d = +11 \end{array}$
$\begin{array}{r} e - 100 = 200 \\ +100 \quad +100 \\ \hline e = 300 \end{array}$	$\begin{array}{r} f + 40 = 70 \\ -40 \quad -40 \\ \hline f = 30 \end{array}$	$\begin{array}{r} a + 15 = 17 \\ -15 \quad -15 \\ \hline a = 2 \end{array}$
$\begin{array}{r} \frac{10a}{10} = \frac{200}{10} \\ \hline a = 20 \end{array}$	$\begin{array}{r} \frac{5b}{5} = \frac{25}{5} \\ \hline b = 5 \end{array}$	$\begin{array}{r} \frac{2c}{2} = \frac{38}{2} \\ \hline c = 17 \end{array}$
$\begin{array}{r} (10) \frac{e}{10} = 20(10) \\ \hline e = 200 \end{array}$	$\begin{array}{r} 5 \times \frac{f}{5} = 5 \times 5 \\ \hline f = 25 \end{array}$	$\begin{array}{r} 4 \times \frac{g}{4} = 6 \times 4 \\ \hline g = 24 \end{array}$

6) Find what number each letter is in the following **TWO** **STEP** equations:

$\begin{array}{r} 15 + 2g = 25 \\ -15 \quad -15 \\ \hline 2g = 10 \\ \frac{2g}{2} = \frac{10}{2} \\ \hline g = 5 \end{array}$	$\begin{array}{r} 150 + 3a = 10 \\ -150 \quad -150 \\ \hline 3a = -140 \\ \frac{3a}{3} = \frac{-140}{3} \\ \hline a = 46.\overline{67} \end{array}$	$\begin{array}{r} 10 + 6d = 22 \\ -10 \quad -10 \\ \hline 6d = 12 \\ \frac{6d}{6} = \frac{12}{6} \\ \hline d = 2 \end{array}$
$\begin{array}{r} \frac{e}{3} - 100 = 200 \\ +100 \quad +100 \\ \hline \frac{e}{3} = 300 \\ 3 \times \frac{e}{3} = 300 \times 3 \\ \hline e = 900 \end{array}$	$\begin{array}{r} \frac{f}{6} + 40 = 100 \\ -40 \quad -40 \\ \hline \frac{f}{6} = 60 \\ 6 \times \frac{f}{6} = 60 \times 6 \\ \hline f = 360 \end{array}$	$\begin{array}{r} 10a + 10 = 10 \\ -10 \quad -10 \\ \hline 10a = 0 \\ \hline a = \frac{0}{10} \end{array}$

Inequalities



1) Finish filling in this chart:

	Greater than	Less than	Greater than or equal to	Less than or equal to
Symbol	$>$	$<$	\geq	\leq
Arrow and dot				

2) Write out a sentence for the following inequalities:

- a) $a < -2$ a is less than -2 .
- b) $78 > b$ b is less than 78
- c) $c \leq 45$ c is 45 or less
- d) $d \geq 0$ d is at least zero
- e) $17 = e$ e is 17 .

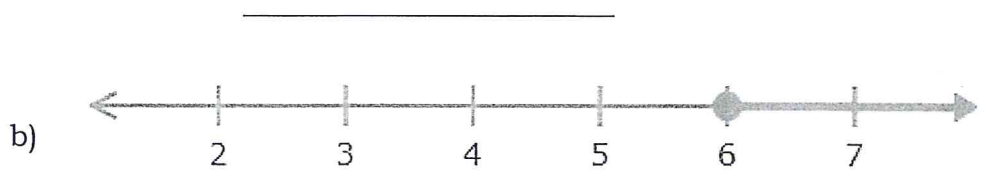
3) Write out inequalities for the following phrases:

- a) f is greater than 34 $f > 34$
- b) g is less than or equal to 9 $g \leq 9$
- c) h is no more than -21 $h \leq -21$
- d) i is more than 52 $i > 52$
- e) j is equal to or bigger than 0 $j \geq 0$
- f) k is at least -67 $k \geq -67$

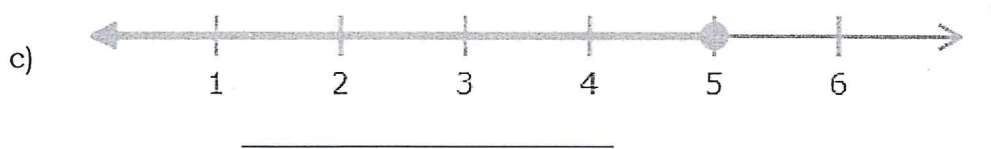
4) Write an inequality (with symbols) for the following graphs:



$x > 9$



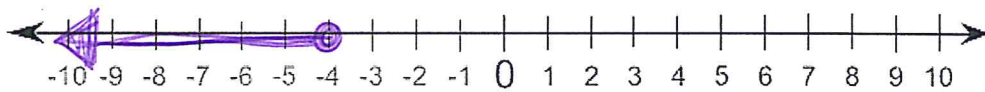
$x \geq 6$



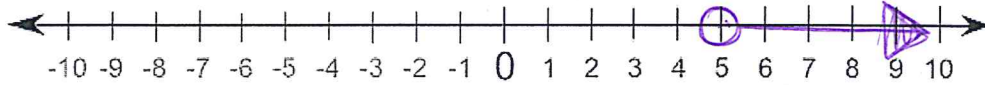
$x \leq 5$

5) Draw a graph for the following inequalities:

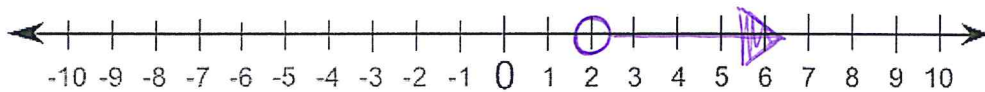
$p \leq -4$



$m > 5$



$2 < a$



6) Solve and graph the following inequalities: (show your work)

$n \leq 18 \div 3$

$n \leq 6$



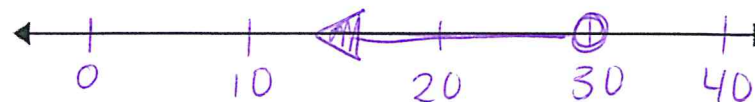
$t < 111 \div 11$

$t < 10.09$



$6 \times 5 > h$

$30 > h$



Linear Relations

1) Fill in the following table:

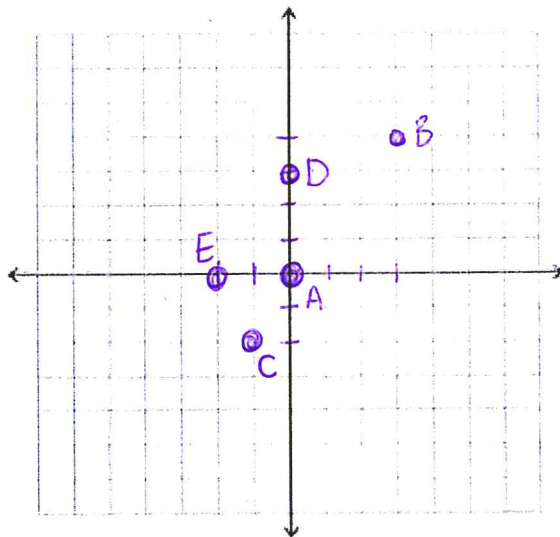
IN	OUT
1	8
5	12
7	14
11	18
<i>Rule: add seven</i>	

2) Fill in the following table:

x	y
-1	-1
0	1
1	3
2	5
<i>Rule: $y = 2x + 1$</i>	

3) Place the following coordinates on the graph:

A = (0,0)	B = (3, 4)	C = (-1, -2)	D = (0, 3)	E = (-2, 0)
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4) Which of the following have a positive slope?

$$y = x + 1$$

$$y = -x + 1$$

$$y = 5x + 2$$

$$y = -x - 3$$

$$y = -x + 100$$

5) Match the following definitions to the relationship
 $y = mx + b$

y		The slope of the graph
m		The height at which the line crosses the y axis.
x		The horizontal coordinate
b		The vertical coordinate

6) Which of the following intersects (crosses) the vertical axis above zero?

$$y = x + 1$$

$$y = -x - 1$$

$$y = 5x + 2$$

$$y = -x - 3$$

$$y = -x + 100$$

7) Which would be the greatest slope?

$$y = 2x + 1$$

$$y = -x + 1$$

$$y = 5x + 2$$

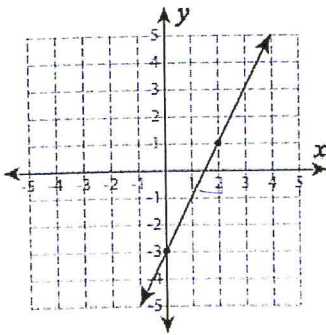
$$y = -70x - 3$$

$$y = -44x + 100$$

final 2 points

8) Write an equation for the following graphs:

1)

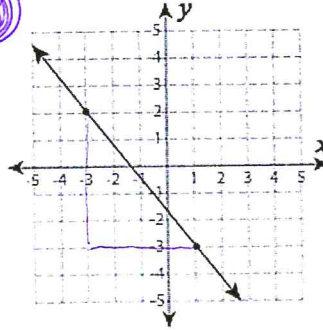


~~$y = 2x - 3$~~

$(2, 1)$

$(0, -3)$

2)

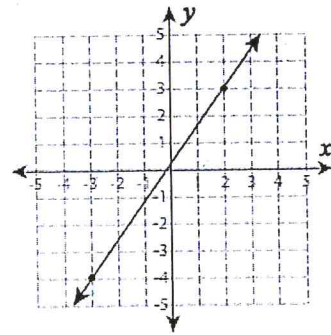


~~$y = -5x - 13$~~

$(-3, 2)$

$(1, -3)$

3)



$(2, 3)$

$(-3, -4)$

9) Amber works at Tasty Treats. She makes \$15 an hour. Each night she makes \$40 in tips. Write an equation with:

- (h) the number of hours she works
- (t) the total amount of money she makes per day.

$$t = 15h + 40$$

10) Julian's dog eats 2 cups of food each day and 3 treats *per day.* ~~every time it finishes a cup of food.~~ Write an equation that considers:

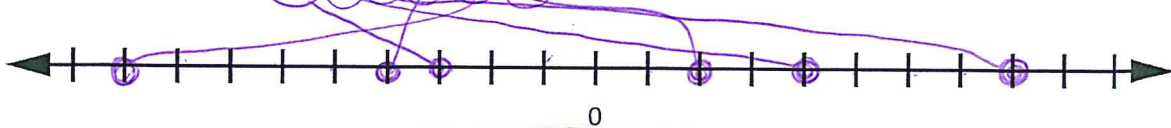
- (t) the total amount of things the dog eats
- (d) the amount of days

$$t = 2d + 3$$

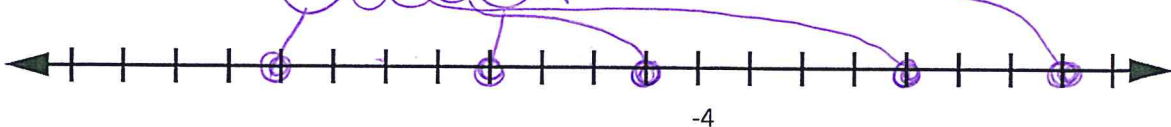
Integers

1) Label the number line:

a. Label: -3, 4, 8, -4, -9, 2



b. Label: -12, 3, 0, -5, -8, 7



2) Order the numbers LEAST TO GREATEST:

12, 17, ~~68~~, 45, ~~6~~, ~~52~~, 23

-68, -52, -6, 0, 12, 17, 23, 45

3) Order the numbers GREATEST TO LEAST:

~~32~~, ~~56~~, ~~2~~, ~~60~~, 10, ~~7~~, ~~0~~, 12

56 > 12 > 10 > 0 > -2 > -7 > -32 > -6

4) Compare these integers using >, <, and =

a. $22 > -12$

b. $-56 < -55$

c. $23 > -32$

d. $9 > -9$

e. $45 = 45$

f. $-76 < -34$

g. $456 > -546$

h. $0 > -1$

i. $-123 < 321$

5) Find the SUM of the integers:

a. $(23) + (7) = \underline{30}$

b. $(18) + (12) = \underline{30}$

c. $(+8) + (-20) = \underline{-12}$

d. $-6 + (-9) = \underline{-15}$

e. $16 + (-9) = \underline{7}$

f. $-11 + 11 = \underline{0}$

6) Find the DIFFERENCE between the integers:

a. $(4) - (8) = \underline{-4}$

b. $(34) - (26) = \underline{8}$

c. $(3) - (-9) = \underline{12}$

d. $28 + (-5) = \underline{23}$

e. $-9 - (-9) = \underline{0}$

f. $21 - (-6) = \underline{27}$

7) What are the rules for multiplying and dividing integers?

- a) When you multiply or divide a positive and a positive number you get a positive number
- b) When you multiply or divide a positive and a negative number you get a negative number
- c) When you multiply or divide a negative and a negative number you get a positive number

8) Find the PRODUCT of the integers:

- a. $6 \times 9 =$ 54 b. $(-7) \times (-3) =$ 21
- c. $12 \times -4 =$ -48 d. $-10 \times (+11) =$ -110
- e. $-6 \times 8 =$ -48 f. $5 \times (+7) =$ 35

9) Find the QUOTIENT of the integers:

- a. $(-18) \div (3) =$ -6 b. $35 \div 5 =$ 7
- c. $(12) \div (-12) =$ -1 d. $16 \div 2 =$ 8
- e. $-28 \div (-7) =$ 4 f. $+16 \div (+4) =$ 4

10) Answer the following MIXED OPERATION questions:

REMEMBER BEDMAS!

a. $(4 + 2) + (6 \div 3) - (10) =$ -2

b. $5 - (8 \div 2) - 4 \div 4 =$ 0

c. $5 - 2 \times 2 =$ 1

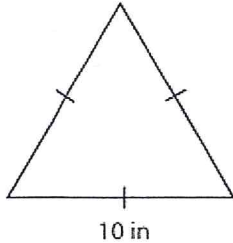
d. $(4 + 2 \times 3) \div 5 =$ 2

e. $18 \div (2 + 4) =$ 3

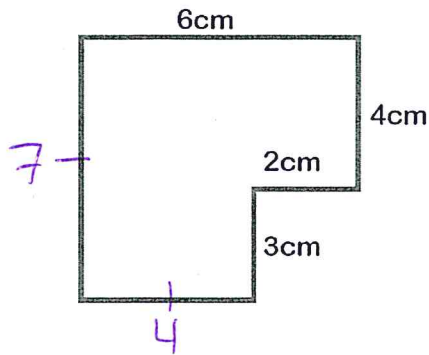
f. $6 - 3 + (3 \div 1) \div 1 =$ 6

Shapes

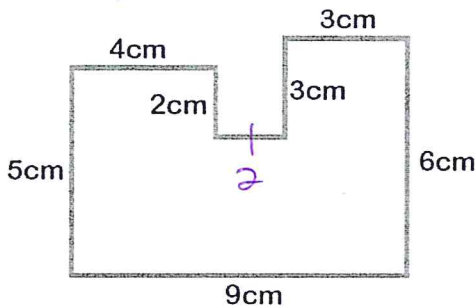
1) Calculate the PERIMETER of the following shapes:



$$10 + 10 + 10 = \boxed{30 \text{ in}}$$

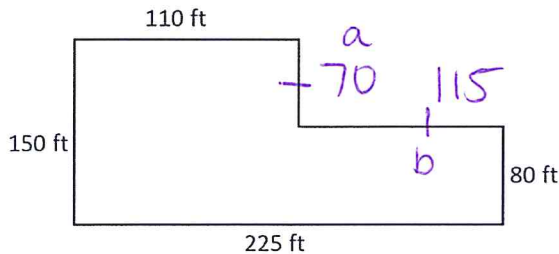


$$\begin{aligned} &6 + 7 + 4 + 3 + 2 + 4 \\ &13 + 7 + 6 \\ &20 + 6 \\ &\boxed{26 \text{ cm}} \end{aligned}$$

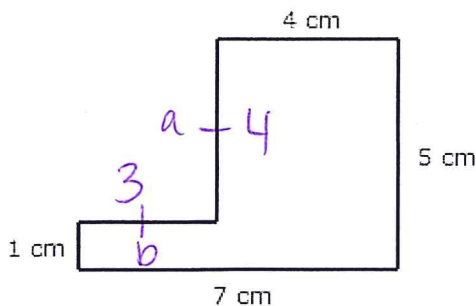


$$\begin{aligned} &5 + 9 + 6 + 3 + 3 + 2 + 2 + 4 \\ &14 + 9 + 7 + 4 \\ &23 + 11 \\ &\boxed{34 \text{ cm}} \end{aligned}$$

2) Calculate the missing sides of the following shapes:

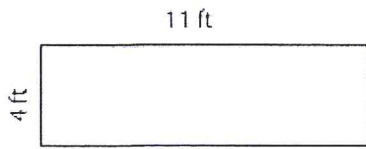


$$\begin{aligned} &a = 150 - 80 \\ &\boxed{a = 70 \text{ ft}} \\ &b = 225 - 110 \\ &\boxed{b = 115 \text{ ft}} \end{aligned}$$



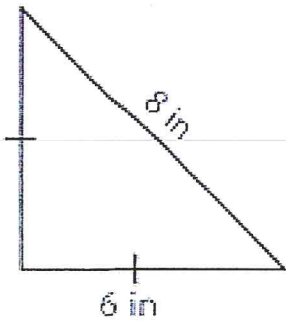
$$\begin{aligned} &a = 5 - 1 \\ &\boxed{a = 4 \text{ cm}} \\ &b = 7 - 4 \\ &\boxed{b = 3 \text{ cm}} \end{aligned}$$

3) Calculate the AREA of the following shapes:



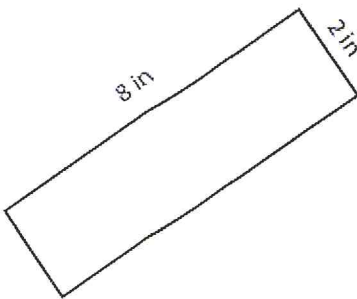
$$11 \times 4 = A$$

$$\boxed{44 \text{ ft}^2} = A$$



$$A = \frac{6 \times 8}{2}$$

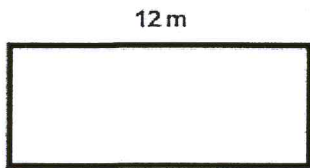
$$A = 48 \div 2 = \boxed{24 \text{ in}^2}$$



$$A = 2 \times 8$$

$$\boxed{A = 16 \text{ in}^2}$$

4) Calculate the missing sides of the following shapes:

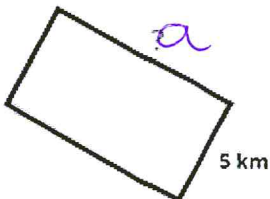


Area = 60 square m

$$60 \text{ m}^2 = 12 \times a$$

$$\frac{60 \text{ m}^2}{12} = \frac{12 \times a}{12}$$

$$\boxed{5 \text{ m} = a}$$



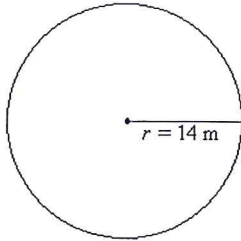
Area = 45 square km

$$45 \text{ km}^2 = 5 \times a$$

$$\frac{45 \text{ km}^2}{5} = \frac{5 \times a}{5}$$

$$\boxed{9 \text{ km} = a}$$

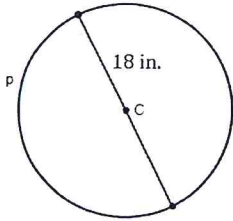
5) Calculate the AREA of the following circles:



$$A = \pi r^2$$

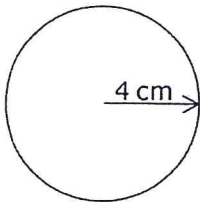
$$A = \pi (14\text{ m})^2$$

$$A = 615.44\text{ m}^2$$



$$A = \pi \times 9\text{ in} \times 9\text{ in}.$$

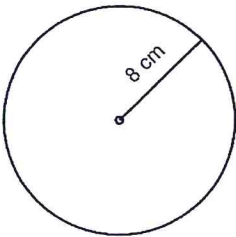
$$A = 254.34\text{ m}^2$$



$$A = \pi \times 4\text{ cm} \times 4\text{ cm}$$

$$A = 50.24\text{ cm}^2$$

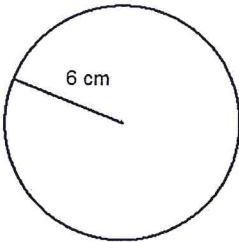
6) Calculate the CIRCUMFERENCE of the following shapes:



$$C = 2\pi r$$

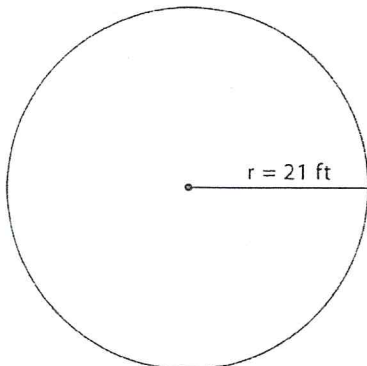
$$C = 2\pi (8\text{ cm})$$

$$C = 50.24\text{ cm}$$



$$C = 2\pi (6\text{ cm})$$

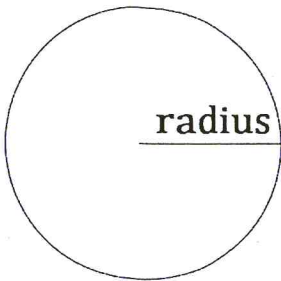
$$C = 37.68\text{ cm}$$



$$C = 2\pi (21\text{ ft})$$

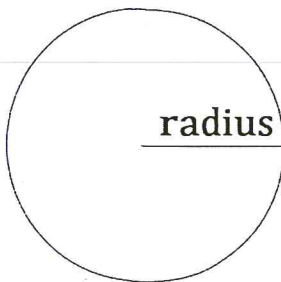
$$C = 131.88\text{ ft}$$

7) Find the missing piece of the following shapes:



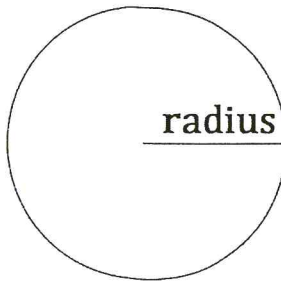
$$\sqrt{\frac{A}{\pi}} = r$$
$$\sqrt{\frac{22}{\pi}} = r = \boxed{7.01m}$$

Area = 22m² what is the radius?



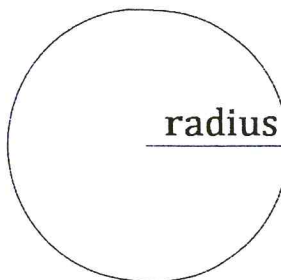
$$\sqrt{\frac{100}{\pi}} = r$$
$$\boxed{r = 31.85cm}$$

Area = 100cm² what is the radius?



$$\sqrt{\frac{40}{\pi}} = r$$
$$r = 12.74 \quad \rightarrow \quad \times 2 = d$$
$$\boxed{d = 25.48m}$$

Area = 40m² what is the diameter?



$$\sqrt{\frac{600}{\pi}} = r$$
$$191.08 = r \quad \rightarrow \quad \times 2 = d$$
$$\boxed{d = 382.17m}$$

Area = 600 in² what is the diameter?