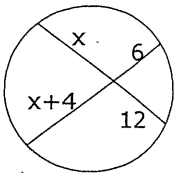
Name _____ Date _____ Period _____

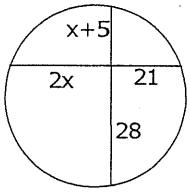
CCGPS Analytic Geometry
Circles Practice 3B

Find the value of x in the figures below.

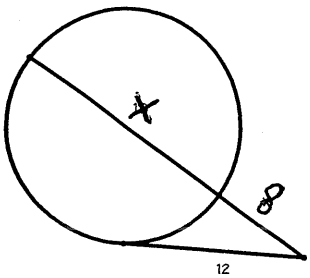
1.



2.



3.



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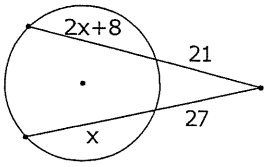
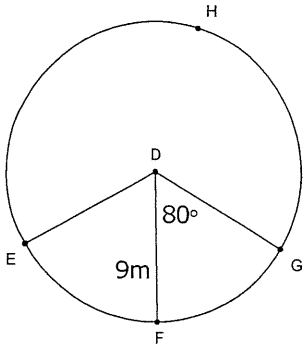


In Circle D, $\angle EDF \cong \angle FDG$. Find the indicated measures.



5. Circumference of circle D

6. Arc length of $\overset{\frown}{EFG}$

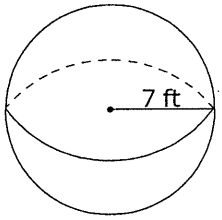
7. Area of circle D

8. Area of the sector formed by $\angle FDG$

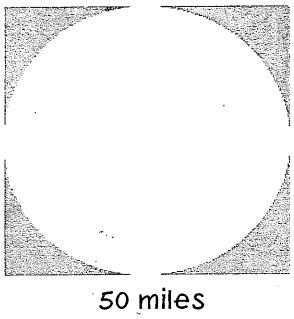
9. Find the diameter of a circle with a central angle of 51° and the area of its sector 51 in². Round to the thousandths.

10. What is the degree measure of an arc of a circle with a radius of 4 cm and an arc length of 3π cm?

11. Calculate the surface area and volume of the sphere.



12. Determine the following info. Leave all answers in exact.



a. Radius of circle

b. Circumference of circle

c. Area of square

d. Area of circle

e. Area of shaded region

13. The surface area of Earth is approximately 510,100,000 km^2. Calculate the diameter of Earth. Round to the thousandths.

14. The volume of an exercise ball is 4500π $inches^3$. Find the radius.

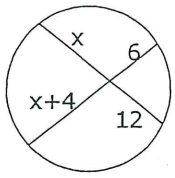
Name Solution Key Date _____ Period _____

CCGPS Analytic Geometry
Circles Practice 3B

* part(part) = part(part)

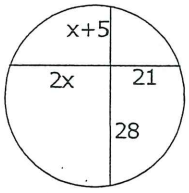
ind the value of x in the figures below.

1.



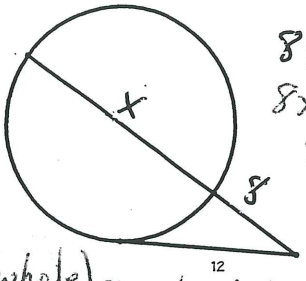
$12(x) = 6(x+4)$
$12x = 6x + 24$
$6x = 24$ $\boxed{x = 4}$

2.



$2x(21) = 28(x+5)$
$42x = 28x + 140$
$14x = 140$
$\boxed{x = 10}$

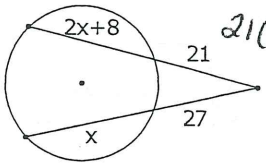
3.



$8(x+8) = 12^2$
$8x + 64 = 144$
$8x = 80$
$\boxed{x = 10}$

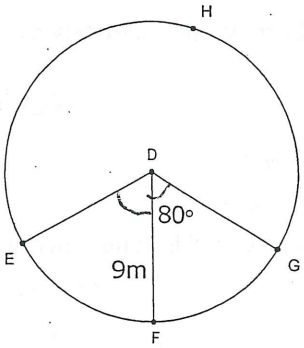
* outside (whole) = outside (whole)

4.



$21(21+2x+8) = 27(x+27)$
$21(29+2x) = 27(x+27)$
$42x + 609 = 27x + 729$
$15x = 120$
$\boxed{x = 8}$

In Circle D, ∠EDF ≅ ∠FDG. Find the indicated measures.



5. Circumference of circle D $C = 2\pi r$

$C = 2\pi(9) = \boxed{18\pi \approx 56.5}$

6. Arc length of $\widehat{EFG}$

$\frac{L}{2\pi r} = \frac{\widehat{Arc}}{360}$ | $\frac{L}{2\pi(9)} = \frac{160}{360}$ | $\frac{L}{56.5} = \frac{4}{9}$ | $9L = 4(56.5)$ $\boxed{L = 25.1}$

7. Area of circle D

$A = \pi r^2$ | $A = \pi(9)^2 = 81\pi \approx 254.5$

8. Area of the sector formed by ∠FDG

$\frac{S}{\pi r^2} = \frac{\widehat{Arc}}{360}$ | $\frac{S}{\pi(9)^2} = \frac{160}{360}$ | $\frac{S}{254.5} = \frac{4}{9}$ | $9S = 4(254.5)$ $\boxed{S = 113.1 \text{ units}^2}$

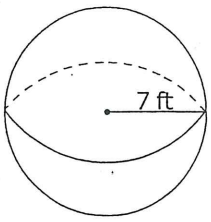
9. Find the diameter of a circle with a central angle of 51° and the area of its sector 51 in². Round to the thousandths.

$\frac{S}{\pi r^2} = \frac{\widehat{Arc}}{360}$ | $\frac{51}{\pi r^2} = \frac{51}{360}$ | $\pi r^2(51) = 51(360)$ | $51\pi r^2 = 18360$ | $160.2r^2 = 18360$ | $r^2 = 114.6$ $\boxed{r = 10.7 \text{ in.}}$

10. What is the degree measure of an arc of a circle with a radius of 4 cm and an arc length of 3π cm?

$\frac{L}{2\pi r} = \frac{\widehat{Arc}}{360}$ | $\frac{3\pi}{2\pi(4)} = \frac{Arc}{360}$ | $\frac{3}{8} = \frac{Arc}{360}$ | $8(Arc) = 3(360)$ | $Arc = \frac{3(360)}{8} = \boxed{135°}$

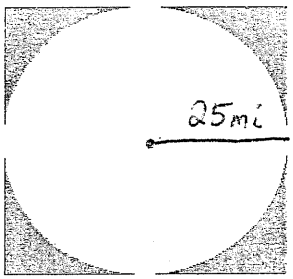
11. Calculate the surface area and volume of the sphere.



$S = 4\pi r^2$
$S = 4\pi(7)^2$
$S = 196\pi$
$\approx 615.8 \text{ ft}^2$

$V = \frac{4\pi}{3} r^3$
$= \frac{4\pi}{3}(7)^3$
$= \frac{1372}{3}\pi$
$\approx \boxed{1436.8 \text{ ft}^3}$

12. Determine the following info. Leave all answers in exact.



a. Radius of circle $\boxed{r = 25\,mi}$

b. Circumference of circle

$C = 2\pi r = 2\pi(25) = 50\pi\ mi \approx \boxed{157.1\,mi}$

c. Area of ~~square~~ (circle)

$A = \pi r^2 = \pi(25)^2 = 625\pi \approx \boxed{1963.5\,mi^2}$

d. Area of ~~circle~~ square

$A = 50^2 = \boxed{2500\,mi^2}$

e. Area of shaded region

$A_{square} - A_{circle}$

$2500 - 1963.5 \approx \boxed{536.5\,mi^2}$

13. The surface area of Earth is approximately 510,100,000 km². Calculate the diameter of Earth. Round to the thousandths.

$S = 4\pi r^2$

$\frac{510{,}100{,}000}{4\pi} = \frac{4\pi r^2}{4\pi}$

$40{,}592{,}468 \approx r^2$

$\boxed{6371.2\,km = r}$

14. The volume of an exercise ball is 4500π inches³. Find the radius.

$V = \frac{4\pi}{3} r^3$

$4500\pi = \frac{4\pi}{3} r^3$

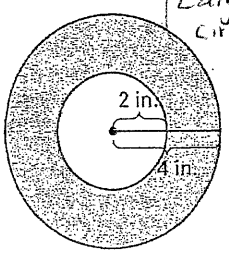
$\frac{4500\pi}{\frac{4\pi}{3}} = \frac{\frac{4\pi}{3} r^3}{\frac{4\pi}{3}}$

$\sqrt[3]{3375} = \sqrt[3]{r^3}$

$15 = r$

$\boxed{r = 15\,in}$

15. Find the area of the shaded region



(Large circle)

$A_{circle} = \pi r^2$

$A = \pi(4)^2$

$A = 16\pi$

(small circle)

$A_{circle} = \pi r^2$

$A = \pi(2)^2$

$= 4\pi$

$A_{shaded} = A_{large} - A_{small}$

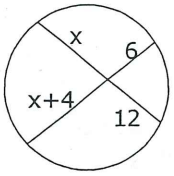
$= 16\pi - 4\pi = 12\pi \approx \boxed{37.7\,in.}$

Name _____ Date _____ Period _____

CCGPS Analytic Geometry
Circles Practice 3B

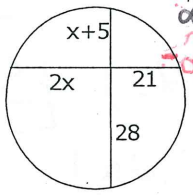
Find the value of x in the figures below.

1.



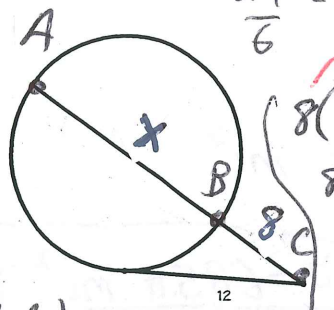
$6(x+4)=12(x)$
$6x+24=12x$
$-6x \quad -6x$
$\frac{24}{6}=\frac{6x}{6}$ $\boxed{x=4}$

2.



$28(x+5)=21(2x)$
$28x+140=42x$
$-28x \quad -28x$
$\frac{140}{14}=\frac{14x}{14}$ $\boxed{x=10}$

3.

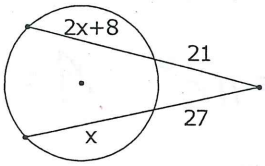


$AB=10$
$AC=18$

outside(whole) = outside(whole)

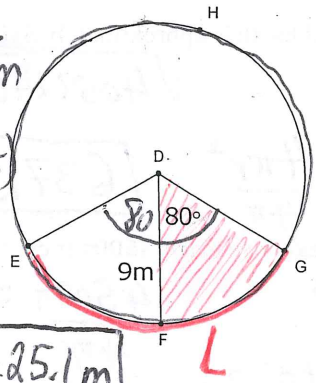
$8(x+8)=12(12)$
$8x+64=144$
$-64 \quad -64$
$\frac{8x}{8}=\frac{80}{8}$
$\boxed{x=10}$

4.



$21(2x+8+21)=27(x+27)$
$21(2x+29)=27(x+27)$
$42x+609=27x+729$
$-27x \quad -27x$
$15x+609=729$
$-609 \quad -609$
$\frac{15x}{15}=\frac{120}{15}$
$\boxed{x=8}$

In Circle D, ∠EDF ≅ ∠FDG. Find the indicated measures.



5. Circumference of circle D $\boxed{C=2\pi r}=2\pi(9)=18\pi_m \approx 56.5m$

6. Arc length of $\overset{\frown}{EFG}$

$\frac{L}{2\pi r}=\frac{\overset{\frown}{Arc}}{360}$ | $\frac{L}{2\pi(9)}=\frac{160}{360}$ | $\frac{L}{56.5}=\frac{4}{9}$ | $9L=4(56.5)$
$9L=226$
$\frac{9L}{9}=\frac{226}{9}$
$\boxed{L=25.1m}$

7. Area of circle D

$A=\pi r^2$ | $A=\pi(9)^2=81\pi m \approx 254.5m$

8. Area of the sector formed by ∠FDG

$\frac{S}{\pi r^2}=\frac{\overset{\frown}{Arc}}{360}$ | $\frac{S}{\pi(9)^2}=\frac{80}{360}$ | $360S=\pi(9)^2(80)$
$360S=20{,}357.52$ | $S=\frac{20{,}357.52}{360}\approx$ $\boxed{S\approx 56.54m^2}$

9. Find the diameter of a circle with a central angle of 51° and the area of its sector 51 in². Round to the thousandths.

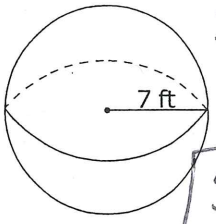
1) find radius
2) find diameter

$\frac{S}{\pi r^2}=\frac{\overset{\frown}{Arc}}{360}$ | $\frac{51}{\pi r^2}=\frac{51}{360}$ | $51\pi r^2=51(360)$
$\frac{51\pi r^2}{51\pi}=\frac{18360}{51\pi}$
$\sqrt{r^2}=\sqrt{114.6}$
$r=10.7$ in.
$d=2(10.7)$
$\boxed{d=21.4 \text{ in.}}$

10. What is the degree measure of an arc of a circle with a radius of 4 cm and an arc length of 3π cm?

$\frac{L}{2\pi r}=\frac{\overset{\frown}{Arc}}{360}$ | $\frac{3\pi}{2\pi(4)}=\frac{\overset{\frown}{Arc}}{360}$ | $\frac{3}{8}=\frac{\overset{\frown}{Arc}}{360}$ | $r=4$
$8(\overset{\frown}{Arc})=3(360)$
$\frac{8(Arc)}{8}=\frac{1080}{8}$
$\boxed{\overset{\frown}{Arc}=135°}$

11. Calculate the surface area and volume of the sphere.

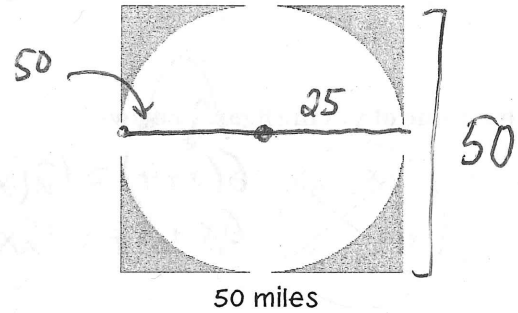


$S=4\pi r^2$
$S=4\pi(7)^2$
$\boxed{S=196\pi \text{ ft}^2}$

$V=\frac{4\pi}{3}r^3$
$V=\frac{4\pi}{3}(7)^3=$ $\boxed{\frac{1372\pi}{3}\text{ ft}^3}$

12. Determine the following info. Leave all answers in exact.

a. Radius of circle $r = 25\text{ mi}$



b. Circumference of circle

$C = 2\pi(25) = \boxed{50\pi \text{ mi}}$

c. Area of square (length)(width)

$(50)(50) = 2500 \text{ mi}^2$

d. Area of circle

$A = \pi r^2 \quad A = \pi(25)^2 = 625\pi \text{ mi}^2$

e. Area of shaded region

$A_{shaded} = A_{square} - A_{circle}$

$\boxed{A_{shaded} = 2500 - 625\pi \text{ mi}^2}$

$A_{shaded} = 536.5 \text{ mi}^2$

13. The surface area of Earth is approximately 510,100,000 km². Calculate the diameter of Earth. Round to the thousandths.

$S = 4\pi r^2$

$\frac{510{,}100{,}000}{4\pi} = \frac{4\pi r^2}{4\pi}$

$\sqrt{40592468.24} = \sqrt{r^2}$

$\boxed{6371.2 \text{ km} = r}$

find radius

$d = 2(r) = \boxed{12742.4 \text{ km}}$

14. The volume of an exercise ball is 4500π inches³. Find the radius.

$V = \frac{4\pi}{3} r^3$

$4500\pi = \frac{4\pi}{3} r^3$

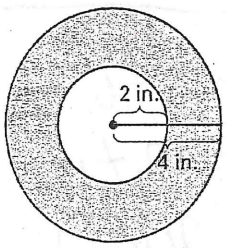
$\frac{4500\pi}{4\pi/3} = \frac{\frac{4\pi}{3} r^3}{\frac{4\pi}{3}}$

$\sqrt[3]{3375} = \sqrt[3]{r^3}$

$\boxed{r = 15 \text{ in.}}$

15. Find the area of the shaded region

$A = \pi r^2$



$A_{Large} = \pi(4)^2 = 16\pi$

$A_{small} = \pi(2)^2 = 4\pi$

$A_{shaded} = A_{Large} - A_{small}$

$= 16\pi - 4\pi = \boxed{12\pi \text{ in}^2}$