Think Radian Worksheet
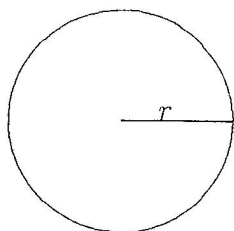
1. What is the circumference?

$$C = \pi d$$
$$C = 2\pi r$$

2. If you measured the circumfrence in terms of the circle's own radius (r), how many are there going once around the circle $(360°)$

$$2\pi$$

3. How many radians are there in 360°?

$$2\pi$$

4. How many radians are there in a straight angle $(180°)$?

$$\pi$$

5. How many radians in a right angle?

$$\pi/2$$

6. How many radians is each angle of an equalateral triangle?

$$\pi/3$$

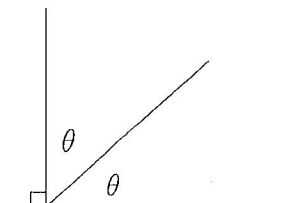7. The minute hand of a clock travels how many radians in 15 minutes?

$$\pi/2$$

8. The minute hand of a clock travels how many radians in 10 minutes?

$$\pi/3$$

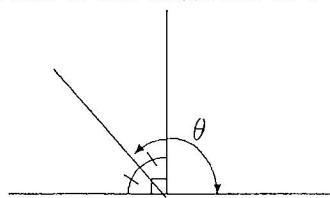9. The minute hand of a clock travels how many radians in 5 minutes?

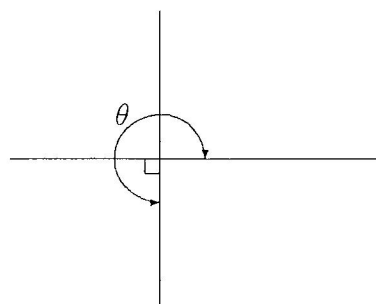$$\frac{\pi}{6}$$

10. The measure of θ (in radians):
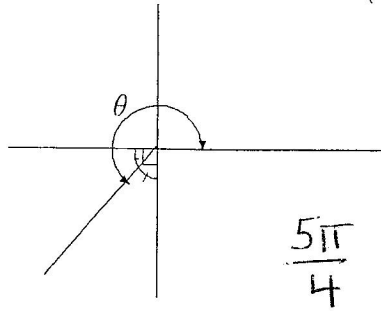

$$\frac{\pi}{4}$$

11. What is the measure of θ (in radians)?

$$\frac{3\pi}{4}$$

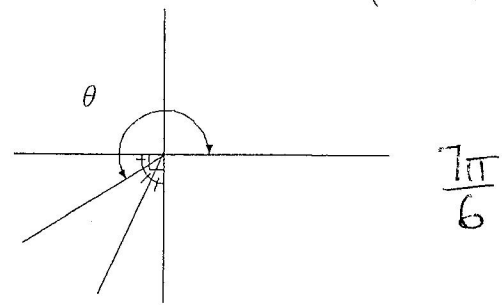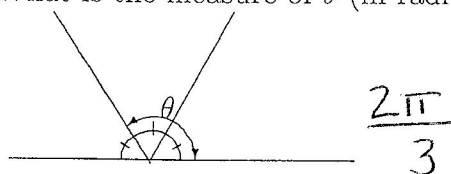12. What is the measure of θ (in radians)?

$$\frac{3\pi}{2}$$

4

13. What is the measure of θ (in radians)?

$\dfrac{5\pi}{4}$

14. What is the measure of θ (in radians)?

$\dfrac{2\pi}{3}$

15. What is the measure of θ (in radians)?

$\dfrac{\pi}{3}$

16. What is the measure of θ (in radians)?

$\dfrac{\pi}{6}$

17. What is the measure of θ (in radians)?

$\dfrac{7\pi}{6}$

18. What is the measure of θ (in radians)?

$\dfrac{5\pi}{6}$

19. $\dfrac{\pi}{3}$ radians is how many degrees?

$60°$
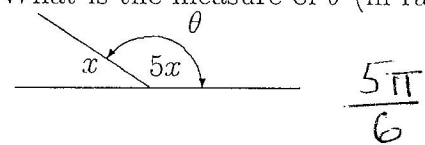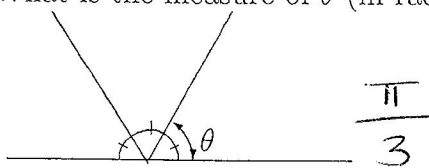
20. $\dfrac{\pi}{6}$ radians is how many degrees?

$30°$

21. $\dfrac{\pi}{2}$ radians is how many degrees?

$90°$
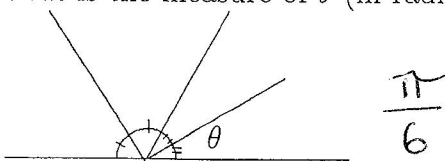
22. $\dfrac{\pi}{4}$ radians is how many degrees?

$45°$

23. $\dfrac{3\pi}{4}$ radians is how many degrees?

$135°$

24. $\dfrac{2\pi}{3}$ radians is how many degrees?

$120°$

ODDS

In problems 1-8, convert from radians to degrees.

1. $\dfrac{\pi}{6}$ $30°$

2. $\dfrac{\pi}{4}$ $45°$

3. $\dfrac{\pi}{10}$ $18°$

4. $\dfrac{3\pi}{5}$ $108°$

5. $\dfrac{7\pi}{9}$ $140°$

6. $\dfrac{13\pi}{20}$ $117°$

7. 2 $\dfrac{360°}{\pi}$ $114.59°$

8. 1.3 $\dfrac{234°}{\pi}$ $74.48°$

In problems 9-12, convert from degrees to radians.

9. $40°$ $\dfrac{2\pi}{9}$

10. $175°$ $\dfrac{35\pi}{36}$

11. $540°$ 3π

12. $124°$ $\dfrac{31\pi}{45}$

In problems 13-14, find the arc length.

13. $r = 2$ in, $\theta = 25$ radians $S = 50$ in

14. $r = 1$ cm, $\theta = 70$ radians $S = 70$ cm

15. A central angle θ intercepts arcs s_1 and s_2 on two concentric circles with radii r_1 and r_2 respectively. Find θ and s_2 if $r_1 = 11$ cm, $s_1 = 9$ cm, and $r_2 = 44$ cm.

$\theta = \dfrac{9}{11}$ radian

$S_2 = 36$ cm

16. A central angle θ intercepts arcs s_1 and s_2 on two concentric circles with radii r_1 and r_2 respectively. Find θ and r_2 if $r_1 = 8$ km, $s_1 = 36$ km, and $s_2 = 72$ km.

$\theta = 4.5$ radian

$r_2 = 16$ km

17. To the nearest inch, find the perimeter of a 10-degree sector cut from a circular disc of radius 11 inches.

$22 + \dfrac{11\pi}{18}$ in

18. A 100-degree arc of a circle has a length of 7 cm. To the nearest centimeter, what is the radius of the circle?

$\dfrac{63}{5\pi} \approx 4$ cm

19. It takes ten identical pieces to form a circular track for a pair of toy racing cars. If the inside arc of each piece is 3.4 inches shorter than the outside arc, what is the width of the track?

$\dfrac{17}{\pi} = 5.4$ in

20. The concentric circles on an archery target are 6 inches apart. The inner circle (red) has a perimeter of 37.7 inches. What is the perimeter of the next-largest (yellow) circle?

$37.7 + 12\pi \approx 75.4$ in

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Right Triangle Trig Practice
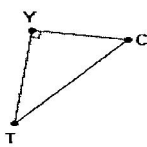
THIS MUST BE DONE ENTIRELY NON-CALCULATOR.

For each special right triangle in problems 1-6, find the **EXACT** value of x.

1) $\angle M = 30°$, $NC = 52$, $CY = x$

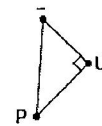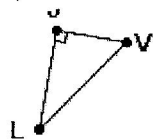$$\frac{52\sqrt{3}}{3}$$

2) $\angle C = 45°$, $TC = 46$, $TY = x$
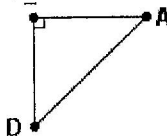
$$23\sqrt{2}$$

3) $\angle E = 45°$, $PU = 8$, $PE = x$

$$8\sqrt{2}$$

4) $\angle V = 60°$, $LV = 42$, $LJ = x$
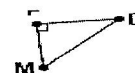
$$21\sqrt{3}$$

5) $\angle A = 45°$, $AD = 7\sqrt{2}$, $AE = x$

$$7$$

6) $\angle M = 60°$, $PM = 4\sqrt{3}$, $PD = x$

$$12$$

7) Which of the following are Pythagorean Triples? (Can be more than one answer)

(A.) 7–24–25   **(B.)** 6–8–10   **(C.)** 5–12–13   **(D.)** 8–15–17   **(E.)** 9–40–41

(A, B, C, D, E all circled)

8) Which of the following is equivalent to $\cos 42°$?

(A.) $\sin 48°$ **B.** $\sin 42°$ **C.** $\csc 42°$ **D.** $\cos 48°$ **E.** $\sec 48°$

(A circled)

9) For $\triangle ABC$, with hypotenuse AC, if $\sin A = 0.6428$, then $\cos C$ is _____

A. $1 + 0.6428$ **B.** $1 - 0.6428$ **(C.)** 0.6428 **D.** $90° - 0.6428$ **E.** $180° - 0.6428$

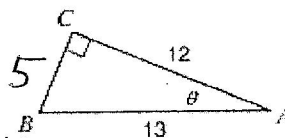*(C circled)*

10) Find the values of all 6 trig functions for $\frac{\pi}{3}$ radians.

$\sin\theta = \frac{\sqrt{3}}{2}$ $\cos\theta = \frac{1}{2}$ $\tan\theta = \sqrt{3}$

$\csc\theta = \frac{2}{\sqrt{3}}$ $\sec\theta = 2$ $\cot\theta = \frac{1}{\sqrt{3}}$

11) Find the value of all 6 trig functions for θ.

$\sin\theta = \frac{5}{13}$ $\cos\theta = \frac{12}{13}$ $\tan\theta = \frac{5}{12}$

$\csc\theta = \frac{13}{5}$ $\sec\theta = \frac{13}{12}$ $\cot\theta = \frac{12}{5}$

12) Let θ be an acute angle such that $\tan\theta = \frac{2}{3}$. Find the other 5 trig ratios.

$\sin\theta = \frac{2}{\sqrt{13}}$ $\cos\theta = \frac{3}{\sqrt{13}}$ $\csc\theta = \frac{\sqrt{13}}{2}$ $\sec\theta = \frac{\sqrt{13}}{3}$ $\cot\theta = \frac{3}{2}$

13) Solve the triangle:

20 cm

10.6 $62°$ $28°$ 22.7

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