

RADIAN MEASURE – SUPPLEMENTARY PROBLEMS

- A** 1. Find the exact number of degrees in the angles whose radian measures are the following.

(a) $\frac{\pi}{4}$ (b) 2π (c) $\frac{3\pi}{4}$ (d) $\frac{3\pi}{2}$
 (e) $\frac{\pi}{6}$ (f) $\frac{5\pi}{6}$ (g) $\frac{\pi}{3}$ (h) $-\frac{3\pi}{2}$
 (i) $-\frac{7\pi}{6}$ (j) $\frac{2\pi}{3}$ (k) $\frac{5\pi}{4}$ (l) $-\frac{5\pi}{2}$

2. Find the exact radian measure in terms of π for each of the following.

(a) 120° (b) 225°
 (c) 315° (d) -270°
 (e) 330° (f) 240°
 (g) -210° (h) 540°
 (i) -180° (j) 135°
 (k) 450° (l) 1080°

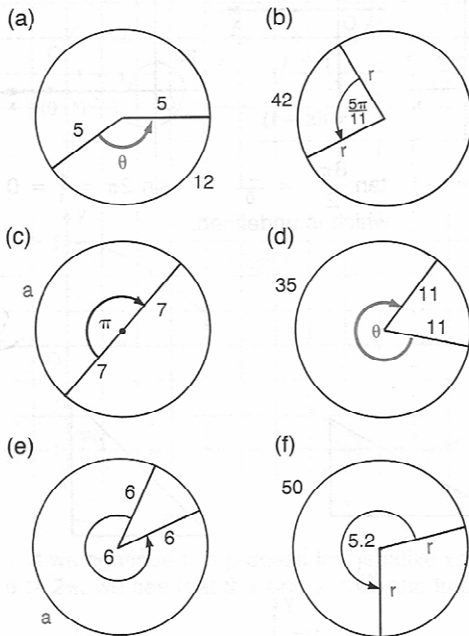
- B** 3. Find the measure to the nearest 0.1° of the angles whose radian measures are the following.

(a) 0.35 (b) 1.25 (c) 0.63 (d) 0.5
 (e) 2.5 (f) 6.25 (g) 1.75 (h) -0.75
 (i) 3.14 (j) -1.21 (k) 8.5 (l) 2.4

4. Find the approximate number of radians to two decimal places in the angles whose degree measures are the following.

(a) 40° (b) 83° (c) 145° (d) 230°
 (e) 325° (f) 35.3° (g) 52.8° (h) 128.5°
 (i) 255.4° (j) 310.9° (k) 27.8° (l) 123.5°

5. Find the indicated quantity in each of the following.



6. A wheel turns at 150 rev/min.
 (a) Find the angular velocity in radians per second.
 (b) How far does a point 45 cm from the point of rotation travel in 5 s?

7. A ferris wheel with radius 31 m makes 2 rotations in one minute.

- (a) Find the angular velocity in radians per second.

- (b) How far has a rider travelled if the ride is 10 min long?

8. A wheel turns with an angular velocity of 10 rad/s.

- (a) What is the rotational frequency in revolutions per minute of this wheel?

- (b) How far will the wheel roll in 8 s if the radius of the wheel is 12 cm?

9. A satellite with a circular orbit has an angular velocity of 0.002 rad/s.

- (a) How long will it take for the satellite to make one orbit?

- (b) What is the speed of the satellite if it is orbiting 800 km above the surface of the earth? (The radius of the earth is 6400 km.)

10. An automobile travels at 100 km/h.

- (a) Find the angular velocity of a tire with radius 36 cm.

- (b) Through what angle will the tire turn in 30 s at this speed?

Answers

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|--|--|-------------------------------------|---|---|--|
| 1. (a) 45°
(g) 60° | (b) 360°
(h) -270° | (c) 135°
(i) -210° | (d) 270°
(j) 120° | (e) 30°
(k) 225° | (f) 150°
(l) -450° |
| 2. (a) $\frac{2\pi}{3}$
(g) $-\frac{7\pi}{6}$ | (b) $\frac{5\pi}{4}$
(h) 3π | (c) $\frac{7\pi}{4}$
(i) $-\pi$ | (d) $-\frac{3\pi}{2}$
(j) $\frac{3\pi}{4}$ | (e) $\frac{11\pi}{6}$
(k) $\frac{5\pi}{2}$ | (f) $\frac{4\pi}{3}$
(l) 6π |
| 3. (a) 20.1°
(g) 100.3° | (b) 71.6°
(h) -43° | (c) 36.1°
(i) 180° | (d) 28.6°
(j) -69.3° | (e) 143.2°
(k) 487° | (f) 358.1°
(l) 137.5° |
| 4. (a) 0.70 rad
(g) 0.92 rad | (b) 1.45 rad
(h) 2.24 rad | (c) 2.53 rad
(i) 4.46 rad | (d) 4.01 rad
(j) 5.43 rad | (e) 5.67 rad
(k) 0.49 rad | (f) 0.62 rad
(l) 2.24 rad |
| 5. (a) 2.4 rad | (b) $\frac{1}{29.4}$ | (c) 7π | (d) 3.2 rad | (e) 36 | (f) 9.6 |
| 6. (a) 5π rad/s
(g) 99.5 r/min | (b) 35.34 m
(h) 960 cm (9.60 m) | | | | (b) 974 m |
| 7. (a) 0.21 rad/s
(g) 52 min 22 s | (b) 2314.8 rad or $132\ 629^\circ$ (approx.) | | | | (b) $46\ 080$ km/h |
| 8. (a) 99.5 r/min
(g) 736.8 r/min | | | | | |
| 9. (a) 5π rad/s
(g) 99.5 r/min | | | | | |
| 10. (a) 736.8 r/min | | | | | |