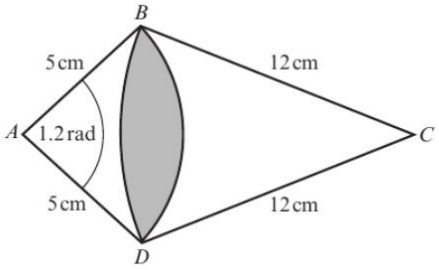
Second Year Assignment Test 4 version O

1) A firework is launched vertically with a speed of $v\ ms^{-1}$. When it reaches its maximum height, the firework explodes into two parts, which are projected horizontally in opposite directions, each with speed $2v\ ms^{-1}$. Show that the two parts of the firework land a distance of $\frac{av^2}{g}\ m$ apart, where a is an integer which should be stated.

2) Find the following integrals

(a) $\int \frac{\sin x \cos x}{\sqrt{(\cos 2x+3)}}\ dx$ b) $\int \frac{\sin x \cos x}{\cos 2x+3}\ dx$

3) The diagram shows two intersecting sectors: ABD, with radius 5 cm and angle 1.2 radians, and CBD, with radius 12 cm.
Find the area of the overlapping section.



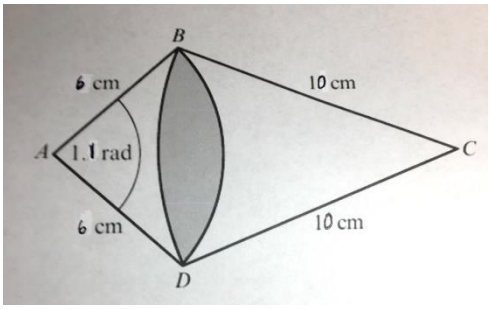
Second Year Assignment Test 4 version P

1) A firework is launched vertically with a speed of $v\ ms^{-1}$. When it reaches its maximum height, the firework explodes into two parts, which are projected horizontally in opposite directions, each with speed $3v\ ms^{-1}$. Show that the two parts of the firework land a distance of $\frac{av^2}{g}\ m$ apart, where a is an integer which should be stated.

2) Find the following integrals

(a) $\int \frac{2\sin x \cos x}{\sqrt{(\cos 2x+3)}}\ dx$ b) $\int \frac{2\sin x \cos x}{\cos 2x+3}\ dx$

3) The diagram shows two intersecting sectors: ABD, with radius 6 cm and angle 1.1 radians, and CBD, with radius 10 cm.
Find the area of the overlapping section.



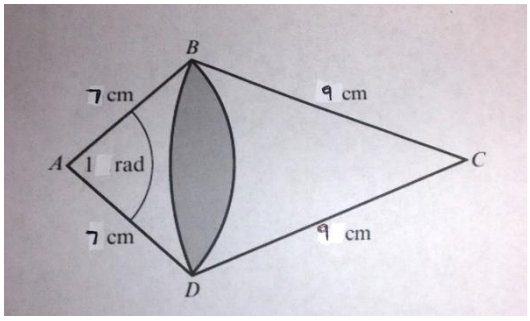
Second Year Assignment Test 4 version Q

1) A firework is launched vertically with a speed of $v\ ms^{-1}$. When it reaches its maximum height, the firework explodes into two parts, which are projected horizontally in opposite directions, each with speed $4v\ ms^{-1}$. Show that the two parts of the firework land a distance of $\frac{av^2}{g}\ m$ apart, where a is an integer which should be stated.

2) Find the following integrals

(a) $\int \frac{3\sin x \cos x}{\sqrt{(\cos 2x + 3)}}\ dx$ b) $\int \frac{3\sin x \cos x}{\cos 2x + 3}\ dx$

3) The diagram shows two intersecting sectors: ABD, with radius 7 cm and angle 1 radian, and CBD, with radius 9 cm.
Find the area of the overlapping section.



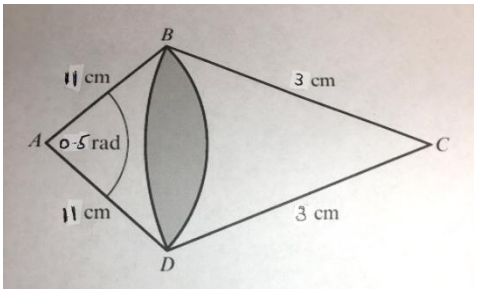
Second Year Assignment Test 4 version R

1) A firework is launched vertically with a speed of $v\ ms^{-1}$. When it reaches its maximum height, the firework explodes into two parts, which are projected horizontally in opposite directions, each with speed $pv\ ms^{-1}$. Show that the two parts of the firework land a distance of $\frac{av^2}{g}\ m$ apart, where a is an integer which should be stated.

2) Find the following integrals

(a) $\int \frac{4\sin x \cos x}{\sqrt{(\cos 2x + 3)}}\ dx$ b) $\int \frac{4\sin x \cos x}{\cos 2x + 3}\ dx$

3) The diagram shows two intersecting sectors: ABD, with radius 11 cm and angle 0.5 radians, and CBD, with radius 3 cm.
Find the area of the overlapping section.



Answers Version O

1) 4

2) a) $-\frac{1}{2}(\cos 2x+3)^{\frac{1}{2}}+c$ b) $-\frac{1}{4}\ln|\cos 2x+3|+c$

3) $4.62\ cm^2$

Answers Version P

1) 6

2) a) $-(\cos 2x+3)^{\frac{1}{2}}+c$ b) $-\frac{1}{2}\ln|\cos 2x+3|+c$

3) $5.88\ cm^2$

Answers Version Q

1) 8

2) a) $-\frac{3}{2}(\cos 2x+3)^{\frac{1}{2}}+c$ b) $-\frac{3}{4}\ln|\cos 2x+3|+c$

3) $6.81\ cm^2$

Answers Version R

1) 2p

2) a) $-2(\cos 2x+3)^{\frac{1}{2}}+c$ b) $-\ln|\cos 2x+3|+c$

3) $8.04\ cm^2$