

Second Year Assignment Test 10 Version O

1. The Venn diagram shows the probabilities of members of a social club taking part in charitable activities.

A represents taking part in an archery competition

R represents taking part in a raffle

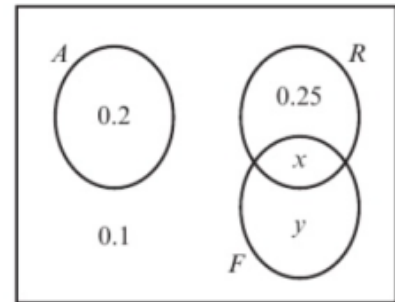
F represents taking part in a fun run

The probability that a member takes part in the archery competition or the raffle is 0.6

a) i) Find the value of x

ii) Find the value of y

b) Show that events R and F are not independent.



2. Find $\int x^2 \cos x \, dx$

3. A particle is projected with velocity $(8\mathbf{i} + 10\mathbf{j})\text{ms}^{-1}$ from a point O at the top of a cliff and moves freely under gravity. Six seconds after projection, the particle strikes the sea at the point S. Calculate

a) the horizontal distance between O and S

b) the vertical distance between O and S

At time T seconds after projection, the particle is moving with velocity $(8\mathbf{i} - 14.5\mathbf{j})\text{ms}^{-1}$.

c) Find the value of T and the position vector, relative to O, of the particle at this instance.

Second Year Assignment Test 10 Version P

1. The Venn diagram shows the probabilities of members of a social club taking part in charitable activities.

A represents taking part in an archery competition

R represents taking part in a raffle

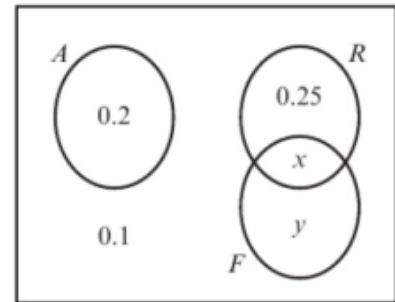
F represents taking part in a fun run

The probability that a member takes part in the archery competition or the raffle is 0.5

a) i) Find the value of x

ii) Find the value of y

b) Show that events R and F are not independent.



2. Find $\int 2x^2 \cos 3x \, dx$

3. A particle is projected with velocity $(16\mathbf{i} + 20\mathbf{j})\text{ms}^{-1}$ from a point O at the top of a cliff and moves freely under gravity. Six seconds after projection, the particle strikes the sea at the point S. Calculate

a) the horizontal distance between O and S

b) the vertical distance between O and S

At time T seconds after projection, the particle is moving with velocity $(16\mathbf{i} - 14.5\mathbf{j})\text{ms}^{-1}$.

c) Find the value of T and the position vector, relative to O, of the particle at this instance.

Second Year Assignment Test 10 Version Q

1. The Venn diagram shows the probabilities of members of a social club taking part in charitable activities.

A represents taking part in an archery competition

R represents taking part in a raffle

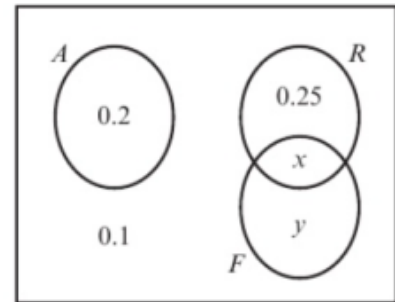
F represents taking part in a fun run

The probability that a member takes part in the archery competition or the raffle is $\frac{36}{55}$

a) i) Find the value of x

ii) Find the value of y

b) Determine whether or not events R and F are independent.



2. Find $\int 2x^2 \cos x \, dx$

3. A particle is projected with velocity $(4\mathbf{i} + 5\mathbf{j})\text{ms}^{-1}$ from a point O at the top of a cliff and moves freely under gravity. Six seconds after projection, the particle strikes the sea at the point S. Calculate

a) the horizontal distance between O and S

b) the vertical distance between O and S

At time T seconds after projection, the particle is moving with velocity $(4\mathbf{i} - 14.6\mathbf{j})\text{ms}^{-1}$.

c) Find the value of T and the position vector, relative to O, of the particle at this instance.

Second Year Assignment Test 10 Version R

1. The Venn diagram shows the probabilities of members of a social club taking part in charitable activities.

A represents taking part in an archery competition

R represents taking part in a raffle

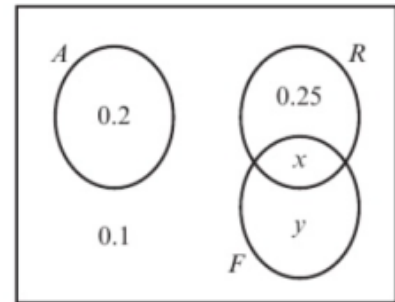
F represents taking part in a fun run

The probability that a member takes part in the archery competition or the raffle is $\frac{36}{55}$

a) i) Find the value of x

ii) Find the value of y

b) Show that events R and F are not independent.



2. Find $\int 2x^2 \cos 2x \, dx$

3. A particle is projected with velocity $(10\mathbf{i})\text{ms}^{-1}$ from a point O at the top of a cliff and moves freely under gravity. Six seconds after projection, the particle strikes the sea at the point S. Calculate

a) the horizontal distance between O and S

b) the vertical distance between O and S

At time T seconds after projection, the particle is moving with velocity $(10\mathbf{i} - 29.4\mathbf{j})\text{ms}^{-1}$.

c) Find the value of T and the position vector, relative to O, of the particle at this instance.

Answers Version O

1 a) $x = 0.15, y = 0.3$

b) $p(F \text{ and } R) = 0.15$ $p(F) \times p(R) = 0.18$ $p(F \text{ and } R) \neq p(F) \times p(R)$

2. $x^2 \sin x + 2x \cos x - 2 \sin x + c$

3. a) 48 m b) 120 m (2 s.f.) c) $T = 2.5 \text{ s}, \mathbf{r} = \left(20\mathbf{i} - \frac{45}{8}\mathbf{j}\right)m$

Answers Version P

1 a) $x = 0.05, y = 0.4$

b) $p(F \text{ and } R) = 0.05$ $p(F) \times p(R) = 0.135$ $p(F \text{ and } R) \neq p(F) \times p(R)$

2. $\frac{2}{3}x^2 \sin 3x + \frac{4}{9}x \cos 3x - \frac{4}{27} \sin 3x + c$

3. a) 96 m b) 56 m (2 s.f.) c) $T = 3.5 \text{ s}, \mathbf{r} = (56\mathbf{i} + 9.7\mathbf{j})m$

Answers Version Q

1 a) $x = \frac{9}{44}, y = \frac{27}{110}$

b) $p(F \text{ and } R) = \frac{9}{44}$ $p(F) \times p(R) = \frac{9}{20} \times \frac{5}{11} = \frac{9}{44}$ $p(F \text{ and } R) = p(F) \times p(R), \therefore$ independent

2. $2x^2 \sin x + 4x \cos x - 4 \sin x + c$

3. a) 24 m b) 150 m (2 s.f.) c) $T = 2 \text{ s}, \mathbf{r} = (8\mathbf{i} - 9.6\mathbf{j})m$

Answers Version R

1 a) $x = \frac{9}{44}, y = \frac{27}{110}$

b) $p(F \text{ and } R) = \frac{9}{44}$ $p(F) \times p(R) = \frac{9}{20} \times \frac{5}{11} = \frac{9}{44}$ $p(F \text{ and } R) = p(F) \times p(R), \therefore$ independent

2. $x^2 \sin 2x + x \cos 2x - \frac{1}{2} \sin 2x + c$

3. a) 60 m b) 180 m (2 s.f.) c) $T = 3 \text{ s}, \mathbf{r} = (30\mathbf{i} - 44\mathbf{j})m$