

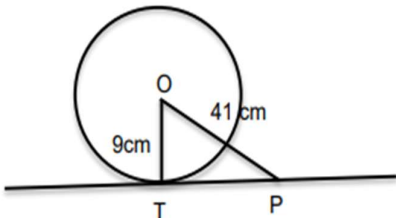
MATHEMATICS STANDARD – Code No.041
MARKING SCHEME
CLASS – X (2025-26)

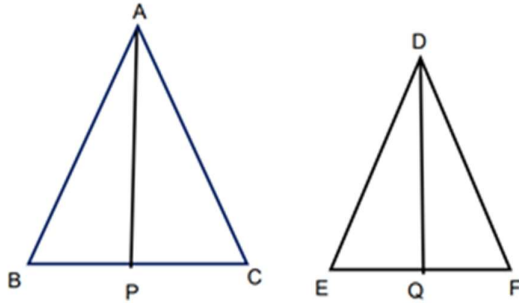
Maximum Marks: 80

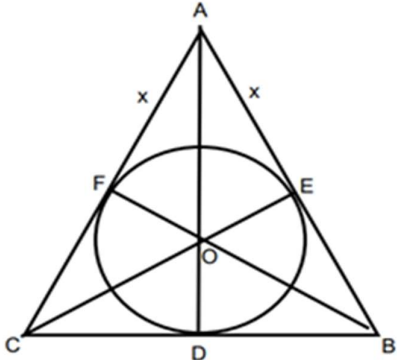
Time: 3 hours

Q.No.	Section A	Marks
1.	(C) 3 $LCM(a, b, c) = 2^2 \times 3^x \times 5 \times 7 = 3780$ $140 \times 3^x = 3780$ $3^x = 27 = 3^3$ $x = 3$	1
2.	(A) 2 As shortest distance from (2, 3) to y-axis is the x coordinate, i.e., 2.	1
3.	(B) $k \neq \frac{15}{4}$ $\frac{3}{2} \neq \frac{2k}{5}$, hence $k \neq \frac{15}{4}$	1
4.	(C) 6cm $AB + CD = AD + BC$ $AB + 4 = 3 + 7$ $AB = 6\text{cm}$	1
5.	(D) $\frac{1}{x}$ $\frac{1}{\sec\theta + \tan\theta} = \frac{(\sec\theta - \tan\theta)}{(\sec\theta + \tan\theta)(\sec\theta - \tan\theta)} = \frac{(\sec\theta - \tan\theta)}{1} = \sec\theta - \tan\theta$	1
6.	(D) $(x + 2)(x + 1) = x^2 + 2x + 3$, so, $x^2 + 3x + 2 = x^2 + 2x + 3$ gives $x - 1 = 0$ It's not a quadratic equation.	1
7.	D) $8\left[\frac{\pi}{6} - \frac{\sqrt{3}}{4}\right] \text{ cm}^2$  Required Area = $8 \times \text{area of one segment (with } r = 1\text{cm and } \theta = 60^\circ)$ $= 8 \times \left(\frac{60^\circ}{360^\circ} \times \pi \times 1^2 - \frac{\sqrt{3}}{4} \times 1^2 \right)$ $= 8\left[\frac{\pi}{6} - \frac{\sqrt{3}}{4}\right] \text{ cm}^2$	1

	For Visually Impaired candidates: (D) $9\pi\text{cm}^2$ area of circle $=\pi(3^2)$ $=9\pi\text{ cm}^2$	
8.	(B) $\frac{31}{36}$ Probability of getting sum 8 is $\frac{5}{36}$ Probability of not getting sum 8 is $\frac{31}{36}$	1
9.	(B) 12° $\sin 5x = \frac{\sqrt{3}}{2}$ So, $5x = 60^\circ$ And hence $x = 12^\circ$	1
10.	(C) 4 Since HCF=81, the numbers can be $81x$ and $81y$ $81x + 81y = 1215$ $x + y = 15$ which gives four pairs as (1,14), (2,13), (4,11), (7,8)	1
11.	(D) 5cm $\pi r^2 = 51$ $V = \frac{1}{3} \times \pi r^2 \times h$ $85 = \frac{1}{3} \times 51 \times h$ $h = \frac{85}{17} = 5\text{cm}$	1
12.	(D) As for equal roots to the corresponding equation, $b^2 = 4ac$ Hence $ac = \frac{b^2}{4}$ And hence $ac > 0 \Rightarrow c$ and a must have same signs	1
13.	(C) 231 Area of sector $= \frac{1}{2} \times l \times r$ $= \frac{1}{2} \times 22 \times 21 = 231\text{cm}^2$	1

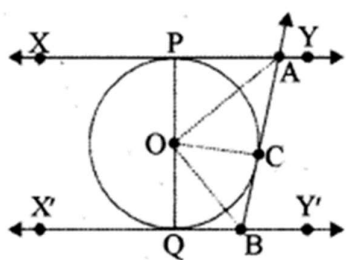
14.	(C) 18cm $\Delta ABC \sim \Delta DEF$ $\frac{AB}{DE} = \frac{BC}{EF} = \frac{AC}{DF} = \frac{\text{Perimeter of } \Delta ABC}{\text{Perimeter of } \Delta DEF}$ $\frac{6}{9} = \frac{\text{Perimeter of } \Delta ABC}{27}$ Perimeter of $\Delta ABC = 18\text{cm}$	1
15.	(B) $\frac{9}{4}$ Probability of getting vowels in the word Mathematics is $\frac{4}{11}$, So, $\frac{2}{2x+1} = \frac{4}{11}$ $\Rightarrow x = \frac{9}{4}$	1
16.	(C) Parallelogram By visualising the figure by plotting points in co-ordinate plane it can be concluded it is a Parallelogram.	1
17.	(A) median is increased by 2	1
18.	(A) 40cm  Since, tangent is perpendicular to the radius at the point of contact In ΔOPT, right angled at T $OP^2 = OT^2 + TP^2$ $41^2 = 9^2 + TP^2$ $TP^2 = 1681 - 81 = 1600$ $TP = 40\text{cm}$	1
19.	(A) Both assertion (A) and reason (R) are true and reason (R) is the correct explanation of assertion (A)	1
20.	(A) $\cos A + \cos^2 A = 1$ -----(i) gives $\cos A = \sin^2 A$ -----(ii) (using $\sin^2 A + \cos^2 A = 1$) Substituting value of $\cos A$ from (ii) in (i) $\sin^2 A + \sin^4 A = 1$ $\therefore$ Both assertion (A) and reason (R) are true and reason (R) is the correct explanation of assertion (A)	1

(Section – B)		
21. (A)	$n = 60, a = 8 \text{ and } d = 2$ $t_{60} = 8 + 59(2) = 126$ $t_{51} = 108$ Hence $t_{51} + t_{52} + \dots + t_{60} = \frac{10}{2}(108 + 126) = 1170$	$\frac{1}{2}$ $\frac{1}{2}$ 1
(B)	OR $230 = 6 + (n - 1)7 \text{ gives } n = 33$ $\therefore \text{Middle Term} = t_{17} = 6 + (16)(7) = 118$	1 1
22.	$A + B = 90^\circ \text{ and } A - B = 30^\circ$ $A = 60^\circ \text{ and } B = 30^\circ$	1 1
23.	 $\triangle ABC \sim \triangle DEF$ $\Rightarrow \frac{AB}{DE} = \frac{BC}{EF}$ $\frac{AB}{DE} = \frac{2B}{2EQ} \text{ (AP and DQ are the medians)}$ $\frac{AB}{DE} = \frac{BP}{EQ}$ In $\triangle ABP$ and $\triangle DEQ$ $\frac{AB}{DE} = \frac{BP}{EQ}$ $\angle B = \angle E$ ($\triangle ABC \sim \triangle DEF$) $\Rightarrow \triangle ABP \sim \triangle DEQ$ Hence, $\frac{AB}{DE} = \frac{AP}{DQ}$	$\frac{1}{2}$ $\frac{1}{2}$ $\frac{1}{2}$ $\frac{1}{2}$
24.(A)	area of grass field that can be grazed by them $= \frac{\theta_1}{360^\circ} \times \pi r^2 + \frac{\theta_2}{360^\circ} \times \pi r^2 + \frac{\theta_3}{360^\circ} \times \pi r^2$ $= \frac{\pi r^2}{360^\circ} (\theta_1 + \theta_2 + \theta_3)$ $= \frac{\pi r^2}{360^\circ} \times 180^\circ$ $= \frac{22}{7} \times \frac{14 \times 14}{2}$ $= 308 \text{ m}^2$	1 1

(B)	OR Area of minor segment = Area of sector – area of triangle $= \frac{90^\circ}{360^\circ} \pi r^2 - \frac{1}{2} \times r^2$ $= \left(\frac{25}{4} \pi - \frac{25}{2} \right) \text{ cm}^2$ Area of major segment = Area of circle – Area of minor segment $= \pi 5^2 - \left(\frac{25}{4} \pi - \frac{25}{2} \right)$ $= 25\pi - \frac{25}{4} \pi + \frac{25}{2}$ $= \left(\frac{75}{4} \pi + \frac{25}{2} \right) \text{ cm}^2$	1 1
25.	 Let r be the radius of the inscribed circle $BD=BE=10\text{cm}$ $CD=CF=8\text{cm}$ $\text{Let } AF=AE=x$ } $\text{ar}(\triangle ABC) = \text{ar}(\triangle AOC) + \text{ar}(\triangle BOC) + \text{ar}(\triangle AOB)$ $= \frac{1}{2} \times r \times AC + \frac{1}{2} \times r \times BC + \frac{1}{2} \times r \times AB$ $90 = \frac{1}{2} \times 4 (x + 8 + 18 + x + 10)$ $x = 4.5\text{cm}$ $\therefore AB = 4.5 + 10 = 14.5\text{cm}$ $AC = 4.5 + 8 = 12.5\text{cm}$ } For Visually Impaired candidates: $AC^2 = AB^2 + BC^2 = 24^2 + 7^2 = 625$ $AC = 25\text{cm}$ $\text{Area of } \triangle ABC = \frac{1}{2} \times 7 \times 24 = 84\text{cm}^2 \text{ -----(i)}$ Let r = radius of circle $\text{Also, Area of } \triangle ABC = \frac{1}{2} (24r + 25r + 7r)$ $= \frac{1}{2} \times 56 r \text{ -----(ii)}$ From (i) and (ii), we get $r = 3\text{cm}$	$\frac{1}{2}$ $\frac{1}{2}$ $\frac{1}{2}$ $\frac{1}{2}$ $\frac{1}{2}$ $\frac{1}{2}$ $\frac{1}{2}$ $\frac{1}{2}$

(Section – C)

26.



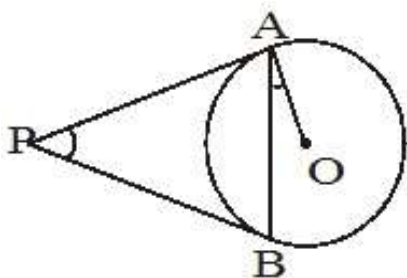
In $\triangle APO$ and $\triangle ACO$
 $AP=AC$ (Tangents from External Point)
 $AO=AO$ (common)
 $OP=OC$ (radii)
 $\triangle APO \cong \triangle ACO$
 $\angle POQ=180^\circ$ (PQ is the diameter)
 $\angle POA + \angle COA + \angle QOB + \angle COB = 180^\circ$
 $2\angle COA + 2\angle COB = 180^\circ$
 $\angle AOB = 90^\circ$

1

1

1

For Visually Impaired candidates:



PA=PB (Tangents from external point to a circle)

$$\angle PAB = \angle PBA = x \text{ (angles opposite to equal sides)}$$

In $\triangle PAB$, $\angle PAB + \angle PBA + \angle APB = 180^\circ$

$$x + x + \angle APB = 180^\circ$$

$$\angle APB = 180^\circ - 2x \text{ -----(i)}$$

Also,

$\angle PAB + \angle OAB = 90^\circ$ (radius is perpendicular to the tangent at the point of contact)

$$x + \angle OAB = 90^\circ$$

$$x = 90^\circ - \angle OAB \quad \text{----- (ii)}$$

Substituting (ii) in (i), we get

$$\angle APB = 180^\circ - 2(90^\circ - \angle OAB)$$

$$\angle APB = 2\angle OAB$$

 $\frac{1}{2}$

1

1

 $\frac{1}{2}$

27.

$$\text{HCF}(36, 60, 84) = 12$$

$$\begin{aligned}\text{Required number of rooms} &= \frac{36}{12} + \frac{60}{12} + \frac{84}{12} \\ &= 3 + 5 + 7 \\ &= 15\end{aligned}$$

1 1/2

1

 $\frac{1}{2}$

28.

$$2x^2 - (1+2\sqrt{2})x + \sqrt{2}$$

$$= 2x^2 - x - 2\sqrt{2}x + \sqrt{2}$$

$$= (2x - 1)(x - \sqrt{2})$$
 Hence the zeroes are $\frac{1}{2}$ and $\sqrt{2}$.

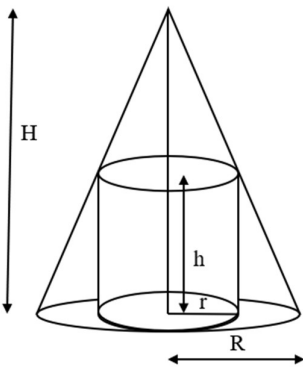
Now $\frac{-b}{a} = \frac{2\sqrt{2}+1}{2} = \sqrt{2} + \frac{1}{2}$ and $\frac{c}{a} = \frac{\sqrt{2}}{2} = \frac{1}{2} \times \sqrt{2}$

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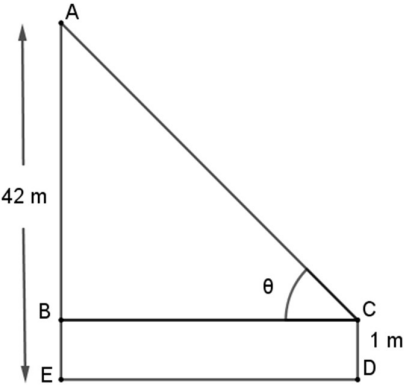
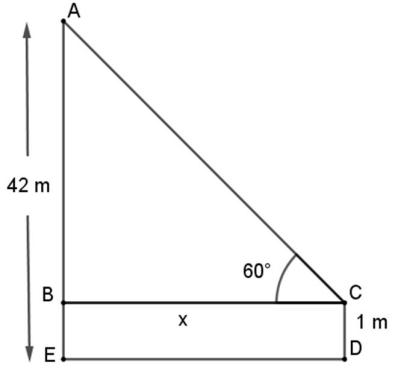
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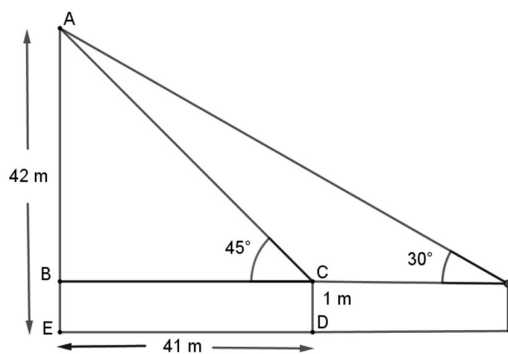
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	Hence, the solution is $x = 2, y = 2$ Area= 2 sq. units For Visually Impaired candidates Let the present age of father be x and son be y So, $(x + 5) = 3(y + 5) \Rightarrow x - 3y = 10$ $x - 5 = 7(y - 5) \Rightarrow x - 7y = -30$ So, $x = 40, y = 10$. Hence the present ages of father and son are 40 years and 10 years Respectively	$\frac{1}{2}$ $\frac{1}{2}$ 1 1 1
Section D		
32.	Let the original speed of train be x km/hr Distance = 63km, time(t_1) = $\frac{63}{x}$ hrs Faster speed = $(x + 6)$ km/hr time (t_2) = $\frac{72}{x+6}$ hrs Now $t_1 + t_2 = 3$ hrs So $\frac{63}{x} + \frac{72}{x+6} = 3$ $63(x + 6) + 72x = 3(x + 6)x$ $135x + 378 = 3x^2 + 18x$ $3x^2 - 117x - 378 = 0$ $x^2 - 39x - 126 = 0$ $x^2 - 42x + 3x - 126 = 0$ gives $(x + 3)(x - 42) = 0$ As x can't be negative, so $x = 42$ km/hr The original speed of train = 42 km/hr	1 1 1 1 1
33.	Correct given, figure and construction Correct Proof since LM is parallel to QR Let PM = x $\frac{PL}{PQ} = \frac{PM}{PR}$ $\frac{5.7}{15.2} = \frac{x}{x+5.5}$ $x = PM = 3.3$cm	2 2 $\frac{1}{2}$ $\frac{1}{2}$

34.	(A)  Slant height of the cone $L = \sqrt{R^2 + H^2} = \sqrt{12^2 + 6^2}$ $= 3\sqrt{20} \text{ cm}$ Curved Surface area of cone $= \pi RL = \pi \times 12 \times 3\sqrt{20}$ $= (36\sqrt{20}) \pi \text{ cm}^2$ Area of base circle of cone (= area of outer circle - area of inner circle + top circular area of cylinder) $= \pi R^2 = \pi \times (12)^2$ $= 144\pi \text{ cm}^2$ Curved Surface area of cylinder $= 2\pi rh = 2\pi \times 4 \times 3$ $= 24 \pi \text{ cm}^2$ Surface area of the remaining solid= Curved surface of cone + area of base circle of cone + curved surface area of cylinder $= (36\sqrt{20})\pi + 144\pi + 24\pi$ $= (168 + 36\sqrt{20})\pi \text{ cm}^2$ OR (B) Volume of cone $= \frac{1}{3}\pi r^2 h = \frac{1}{3}\pi \times 3 \times 3 \times 12 = 36\pi \text{ cm}^3$ Volume of ice-cream in the cone $= \frac{5}{6} \times 36\pi \text{ cm}^3 = 30\pi \text{ cm}^3$ Volume of ice-cream in the hemispherical part $= \frac{2}{3}\pi r^3 = \frac{2}{3}\pi \times 3 \times 3 \times 3 = 18\pi \text{ cm}^3$ Total volume of the ice-cream $= (30\pi + 18\pi) = 48\pi = 150.86 \text{ cm}^3$ (approx.)	$\frac{1}{2}$ 1 1 1 1 $\frac{1}{2}$ 2 $1 + \frac{1}{2}$ $1 + \frac{1}{2}$																																
35.	(A) Mode of the frequency distribution = 55 Modal class is 45-60. Lower limit is 45 Class Interval (h) = 15 Now, Mode $= l + \left(\frac{f_1 - f_0}{2f_1 - f_0 - f_2} \right) \times h$ $55 = 45 + \frac{15 - x}{30 - x - 10} \times 5$ So, $x = 5$ <table border="1"><thead><tr><th>CI</th><th>f_i</th><th>x_i</th><th>$f_i x_i$</th></tr></thead><tbody><tr><td>0-15</td><td>10</td><td>7.5</td><td>75</td></tr><tr><td>15-30</td><td>7</td><td>22.5</td><td>157.5</td></tr><tr><td>30-45</td><td>5</td><td>37.5</td><td>187.5</td></tr><tr><td>45-60</td><td>15</td><td>52.5</td><td>787.5</td></tr><tr><td>60-75</td><td>10</td><td>67.5</td><td>675</td></tr><tr><td>75-90</td><td>12</td><td>82.5</td><td>990</td></tr><tr><td></td><td>59</td><td></td><td>2872.5</td></tr></tbody></table> Mean $= \bar{x} = \frac{2872.5}{59} = 48.68$	CI	f_i	x_i	$f_i x_i$	0-15	10	7.5	75	15-30	7	22.5	157.5	30-45	5	37.5	187.5	45-60	15	52.5	787.5	60-75	10	67.5	675	75-90	12	82.5	990		59		2872.5	$\frac{1}{2}$ 1 1 $1 \frac{1}{2}$ 1
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	OR (B) <table><thead><tr><th>Height (in cm)</th><th>Number of girls</th><th>Class Interval</th><th>frequency</th></tr></thead><tbody><tr><td>less than 140</td><td>04</td><td>135-140</td><td>4</td></tr><tr><td>less than 145</td><td>11</td><td>140-145</td><td>7</td></tr><tr><td>less than 150</td><td>29</td><td>145-150</td><td>18</td></tr><tr><td>less than 155</td><td>40</td><td>150-155</td><td>11</td></tr><tr><td>less than 160</td><td>46</td><td>155-160</td><td>6</td></tr><tr><td>less than 165</td><td>51</td><td>160-165</td><td>5</td></tr></tbody></table> Median = $l + \left(\frac{\frac{N}{2} - cf}{f}\right) \times h$ = $145 + \left(\frac{\frac{51}{2} - 11}{18}\right) \times 5$ = 149.03 Median height = 149.03cm $3 \times \text{Median} = \text{Mode} + 2 \times \text{Mean}$ $3 \times 149.03 = 148.05 + 2 \times \text{Mean}$ Mean = 149.52	Height (in cm)	Number of girls	Class Interval	frequency	less than 140	04	135-140	4	less than 145	11	140-145	7	less than 150	29	145-150	18	less than 155	40	150-155	11	less than 160	46	155-160	6	less than 165	51	160-165	5	1 1 1 1
Height (in cm)	Number of girls	Class Interval	frequency																											
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	Section E																													
36.	(i) Common difference of first progression= 3 Common difference of first progression= -3 Sum of common difference=0. (ii) $t_{34} = 187 + (34-1) (-3)$ So, $t_{34} = 88$ (iii) (A) Sum = $\frac{10}{2} [2(-5) + (10 - 1)(3)]$ = 85 OR (B) $-5 + (n-1)3 = 187 + (n-1) (-3)$ $n = 33$	1 1 1 1 1 1																												

37.	(i) $PR = \sqrt{(8-2)^2 + (3-5)^2} = 2\sqrt{10}$ (ii) Co-ordinates of Q (4,4). The mid-point of PR is (5,4) $\therefore$ Q is not the mid-point of PR (iii) (A) Let the point be (x,0) $\text{So, } \sqrt{(2-x)^2 + 25} = \sqrt{(4-x)^2 + 16}$ $\text{Hence } x = \frac{3}{4}. \text{ Therefore the point is } (\frac{3}{4}, 0).$ OR (B) The coordinates of S will be $\left(\frac{2 \times 4 + 3 \times 2}{2+3}, \frac{2 \times 4 + 3 \times 5}{2+3} \right)$ $= \left(\frac{14}{5}, \frac{23}{5} \right)$	1 $\frac{1}{2}$ $\frac{1}{2}$ 1 1 1 1
38.	  (i) Distance from India gate = 41m, Height of monument = 42m, Shreya's height = 1m So, $\tan \theta = \frac{41}{41} = 1$ Angle of elevation = $\theta = 45^\circ$. (ii) Angle of elevation = 60° Perpendicular = 41m Let the distance from the India Gate be x m Hence $\tan 60^\circ = \frac{41}{x}$ $\Rightarrow x = \frac{41}{\sqrt{3}}$ $\therefore$ Shreya is standing at a distance of $\frac{41\sqrt{3}}{3}$ m	$\frac{1}{2}$ $\frac{1}{2}$ $\frac{1}{2}$ $\frac{1}{2}$



(iii) (A)

Distance from the India Gate = 41 m

Let the distance moved back be x m

$$\text{Then, } \tan 30^\circ = \frac{41}{41+x}$$

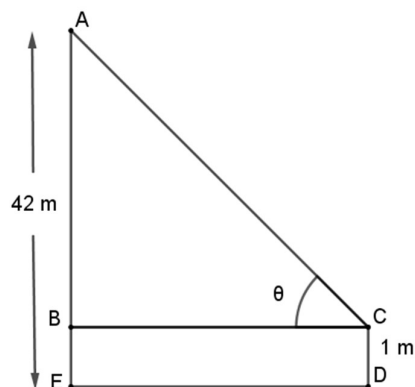
$$x = (41\sqrt{3} - 41) \text{ m} = 41(\sqrt{3} - 1) \text{ m}$$

$$\therefore \text{The distance moved back} = 41(\sqrt{3} - 1) \text{ m}$$

1

1

OR



(B) Let the angle of elevation of be θ

$$\text{Now, } \tan \theta = \frac{41}{\frac{41}{\sqrt{3}}} = \sqrt{3}$$

$$\text{This gives } \theta = 60^\circ$$

1

1