

2013 CREDIT MATHS PAPER 2 SOLUTIONS

$$1. \quad D = 3 \text{ km} \\ = 3000 \text{ m}$$

$$S = \frac{D}{T} \text{ m/s}$$

$$T = 16 \text{ days} \\ = (16 \times 24 \times 60 \times 60) \text{ seconds} \\ = 1\,382\,400 \text{ s}$$

$$S = \frac{D}{T}$$

$$S = \frac{3000}{1\,382\,400}$$

$$S = 0.00217$$

$$S = 2.17 \times 10^{-3} \text{ m/s}$$

$$2. \quad 2x^2 + 7x - 3 = 0$$

$$a = 2 \quad b = 7 \quad c = -3$$

$$x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$$

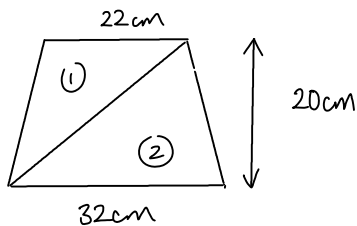
$$x = \frac{-7 \pm \sqrt{7^2 - 4(2)(-3)}}{2(2)}$$

$$x = \frac{-7 \pm \sqrt{49 + 24}}{4}$$

$$x = \frac{-7 + \sqrt{73}}{4} \quad \text{or} \quad x = \frac{-7 - \sqrt{73}}{4}$$

$$x = 0.4 \quad x = -3.9$$

3. (a)



$$A_1 = \frac{1}{2}bh$$

$$= \frac{1}{2}(22)(20)$$

$$= 220 \text{ cm}^2$$

$$A_2 = \frac{1}{2}bh$$

$$= \frac{1}{2}(32)(20)$$

$$= 320 \text{ cm}^2$$

$$\text{Total Area} = 540 \text{ cm}^2$$

(b) $V = Ah$

$$V = 540 \times 60$$

$$V = 32\,400 \text{ cm}^3$$

4. $72\% = 1296$
 $1\% = 1296 \div 72$
 $= 18$
 $28\% = 504$

72% passed
 $\Rightarrow 28\%$ failed

504 people failed the test.

5. $A = \frac{1}{2} ab \sin C$
 $9 = \frac{1}{2} x \cdot x \cdot \sin 30$
 $9 = \frac{1}{2} x^2 \cdot \frac{1}{2}$
 $9 = \frac{1}{4} x^2$
 $x^2 = 36$
 $x = 6 \text{ cm}$

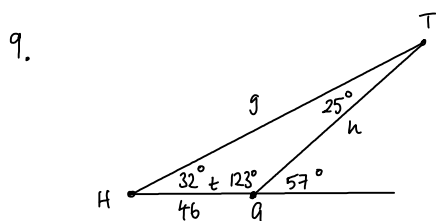
6. $r^2 = 19^2 - 18 \cdot 2^2$
 $r^2 = 361 - 331.24$
 $r^2 = 29.76$
 $r = \sqrt{29.76}$
 $r = 5.46 \text{ m}$

$C = \pi d$
 $C = \pi \times 10.92$
 $C = \underline{\underline{34.3 \text{ m}}}$

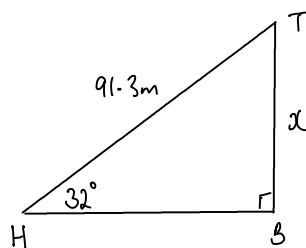
7. $94 \times 0.93 = 87.42$
 $87.42 \times 0.93 = 81.3$
 $81.3 \times 0.93 = 75.6$
 $75.6 \times 0.93 = 70.3$

\Rightarrow He will reach his target during April.

8. $\frac{x^\circ}{360^\circ} = \frac{\text{Arc AB}}{\pi d}$
 $\frac{x^\circ}{360^\circ} = \frac{36.7}{\pi \times 100}$
 $x^\circ = \frac{36.7}{100\pi} \times 360^\circ$
 $x^\circ = \underline{\underline{42^\circ}}$



$\frac{g}{\sin 57^\circ} = \frac{h}{\sin 155^\circ} = \frac{t}{\sin 25^\circ}$
 $\frac{g}{\sin 57^\circ} = \frac{t}{\sin 25^\circ}$
 $g = \frac{46 \sin 123^\circ}{\sin 25^\circ}$
 $g = 91.3 \text{ m}$

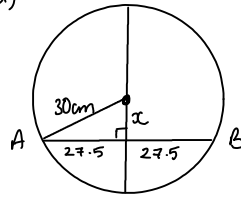


$\sin x^\circ = \frac{\text{opp}}{\text{hyp}}$
 $\sin 32^\circ = \frac{x}{91.3}$
 $x = 91.3 \sin 32^\circ$
 $x = 48.4$
 $\underline{\underline{TP = 48.4 \text{ m}}}$

10. (a) $f(x) = 4 \times 2^x$
 $f(3) = 4 \times 2^3$
 $= 4 \times 8$
 $= 32$

(b) $f(m) = 4$
 $4 \times 2^m = 4$
 $2^m = 1$
 $m = 0$

11. (a)



$$x^2 = 30^2 - 27.5^2$$

$$x^2 = 900 - 756.25$$

$$x^2 = 143.75$$

$$x = \sqrt{143.75}$$

$$x = 12.0 \text{ cm to 1 d.p.}$$

$$\text{Depth} = 30 - 12$$

$$= 18 \text{ cm}$$

(b) $60 - 18 = 42 \text{ cm}$

(water 18 cm from top)

12. $1 + \sin \alpha^\circ = 1.7$

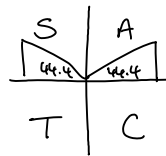
$$\sin \alpha^\circ = 0.7$$

$$\text{acute angle} = \sin^{-1}(0.7)$$

$$= 44.4^\circ$$

$$\alpha^\circ = 44.4^\circ, 135.6^\circ$$

$$\alpha_A = 44.4^\circ \quad \alpha_B = 135.6^\circ$$



$$180^\circ - 44.4^\circ = 135.6^\circ$$

13. Card width = 35 cm

$$\text{S.F. (enlargement)} = \frac{35}{25}$$

$$= \frac{7}{5}$$

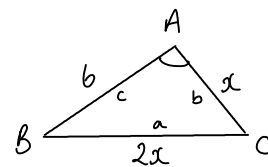
$$\text{Card length} = \frac{7}{5} \times 40$$

$$= 56 \text{ cm}$$

$$56 = 40 + 5 + x$$

$$x = 11 \text{ cm}$$

14.



$$\cos A = 0.5$$

$$a^2 = b^2 + c^2 - 2bc \cos A$$

$$(2x)^2 = x^2 + (6)^2 - 2x \cdot (6)(0.5)$$

$$4x^2 = x^2 + 36 - 6x$$

$$3x^2 + 6x - 36 = 0$$

$$x^2 + 2x - 12 = 0$$