Plane Geometry Assignment (solutions)

1. (a) $x = 48$ (straight ∠) 2

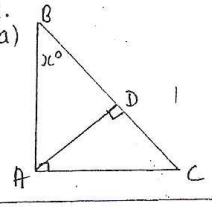
(b) $a = 112$ (straight ∠)
$b = 112$ (vert. opp ∠s)
$c = 68$ (vert - opp ∠s) 6

(c) $f = 57$ (corrt. ∠s and parallel lines) 2

(d) $a = 69$ (ext. ∠ of Δ) 2

(e) $y = 80$ (corrt ∠s and parallel lines)
$x = 53$ (ext. ∠ of Δ 4 (16)

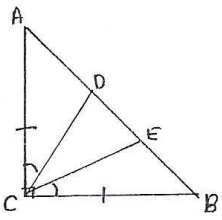
2. (a)



1

(b) $\angle BDC = 90°$ (given)
$\angle BAD = 90° - x°$ (∠sum Δ)
$\angle ADC = 90°$ (given)
$\angle DAC = x°$ (right ∠)
$\angle DCA = 90° - x°$ 1
(∠sum Δ) (4)

3.



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$\angle A = \angle B = 45°$ (base ∠s in right isos Δ)

Let $\angle ACD = \angle BCE = x°$ (given)

$\therefore \angle CDE = \angle CED = 45° + x°$ (4)
(ext ∠ of Δ) 3

$\therefore$ Δ CDE is isosceles (base ∠s are equal)

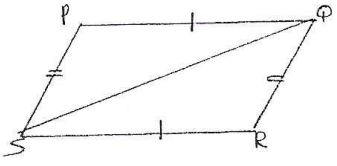
4 (a) $\frac{(10-2) \times 180°}{10} = 144°$ 2

(b) $360° \div 6 = 60°$ 1

(c) $\frac{(n-2) \times 180}{n} = 168$

$180n - 360 = 168n$
$12n = 360$
$n = 30$ 3 (6)
$\therefore$ 30 sides

5.



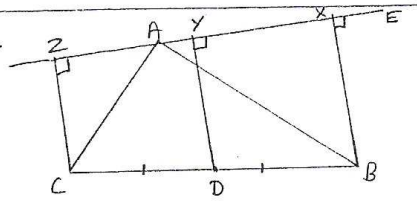
(a) $PQ = SR$ (given)
$PS = QR$ (given)
QS is common 4
$\Delta PQS \equiv \Delta RSQ$ (SSS)

(b) $\angle PQS = \angle QSR$ (corresp ∠s in cong. Δs) 1

(iii) $PQ \parallel SR$ (alternate angles are equal) 1

(iv) PQRS is a parm (pair of opp sides, PQ and RS, are equal and parallel 1 (7)

6.



$\angle YZC = \angle XYD = \angle EXB = 90°$ (given)
$\therefore ZC \parallel YD \parallel XB$ (corresp ∠s are equal)

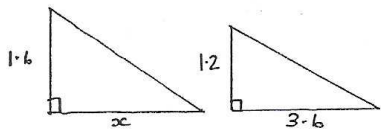
$\therefore \frac{CD}{DB} = \frac{ZY}{YX}$ (intercepts on parallel lines are equal)

$\therefore ZY = YX$ (since $CD = DB$) (4)

7. (a) $\angle EDA = \angle ABB = 90°$ (given)
$\angle A$ is common
$\therefore$ Δ ABC ||| Δ AED (equiangular) 3

(b) $\frac{AB}{AE} = \frac{AC}{AD} = \frac{BC}{ED}$ 3 (6)

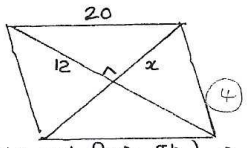
8.



$\frac{x}{3·6} = \frac{1·6}{1·2}$ $\therefore x = \frac{1·6 \times 3·6}{1·2} = 4·8$

$\therefore$ shadow is 4·8m (2)

9.

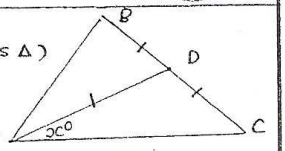


$x^2 = 20^2 - 12^2$
$= 256$
$x = 16$ 2
$\therefore$ diagonal is 32cm (4)
(Diagonals bisect at right ∠s and Pyth. Th) 2

10. Area $= 400 \times 10 \times 5 = 20000\ cm^2$ 1
Area of new tile $= 4^2 = 16\ cm^2$ 1
$\therefore$ No. of tiles $= 20000 \div 16 = 1250$ 1 (3)

11. Old length $= s$ New length $= 1·5s$
Old area $= s^2$ New area $= (1·5s)^2 = 2·25s^2$
$\therefore$ area increased by 125% (3)

12. Let $\angle DAC = x°$
$\therefore \angle DCA = x°$ (base ∠s in isos Δ)
$\angle BDA = 2x°$ (ext ∠ of Δ)
$\angle BAD = \frac{180° - 2x°}{2} = 90° - x°$
(∠sum of Δ)



$\therefore \angle BAC = \angle BAD + \angle DAC$ (3)
$= 90° - x° + x°$
$= 90°$