

King's Canterbury 16+ solutions 2014

- 1) £234.36
- 2) 320 seconds
- 3) £15.50
- 4) a) 3:2
b) 45
- 5) a) $x^2 - 21x + 68$
b) $\frac{3}{4}$
- 6) $x = 6, y = -2$
- 7) i) m^9
ii) p^4
iii) $10x^4y^9$
iv) $4k+32$
- 8) $y = -\frac{1}{4}x + 3$
- 9) a) i) 1
ii) $\frac{1}{25}$
iii) 5
iv) $\frac{1}{3}$
b) $1 - \frac{k}{2}$
- 10) a) The upper section of the two between A and B.
b) i) $28-x$
ii) The number of people who chose archery and cycling but not badminton = $27 - x$
So the number of people who chose archery only is
 $63 - (27 - x) - (28 - x) - x = 8 + x$
iii) $120 = (\text{number who chose badminton}) + (\text{number who chose cycling}) - (\text{number who chose badminton and cycling}) + (8+x)$
 $120 = 62 + 69 - 32 + 8 + x$
 $x = 13.$
- 11) a) A diameter meets a tangent at 90 degrees. $90 - 56 = 34$ degrees
b) $OPR = 56$ (angle in a semicircle = 90 and $PQR = 34$)
 $ORP = 56$ (triangle formed by 2 radii is isosceles)
 $ORT = 90$ (radius meets tangent at 90 degrees)
 $PRT = 146$ degrees (add the angles ORP and ORT)
- 12) a) $y = \frac{25}{16}x^2$
b) $y = \frac{25}{4}$
c) $\frac{12}{5} = 2.4$
- 13) 6.71cm
- 14) 12.975 minutes
- 15) a) $\frac{10}{7}$
b) $\frac{fv}{v-f}$

- 16)a) 51.3°
b) 10.5cm
- 17)a) $(2x + 3)(x + 4) - (x + 2)^2 = 20$
 $x^2 + 7x - 12 = 0$
b) i) $x=1.424$ or $x=-8.424$
ii) 22.5cm
- 18) $\frac{131}{190}$
- 19) $\frac{x-3}{2x+3}$
- 20) OTR=90 (radius meets a tangent at 90 degrees)
OTA=28 (90-62)
 $\gamma=124$ degrees (OAT is isosceles as contains two radii, and angles in a triangle add to 180)
- 21) (3,7) and (2,5)
- 22) 10.9cm^2
- 23) 12.5km
- 24) $(3n + 1)^2 - (3n - 1)^2 = (3n + 1 - (3n - 1))(3n + 1 + 3n - 1)$
 $= 2(6n) = 12n = 4(3n)$, which is a multiple of 4