~~12~~ 12 Theta App 1996

$\therefore \frac{x}{100} + 1 \cdot y = (x+y)\frac{2x}{100}$

1) $x^2 + 100y = 2x^2 + 2xy$

$y = \frac{x^2}{100 - 2x}$ C

2) $7x = 3 \cdot 50$

$x = 21\frac{3}{7}$ A

3) $\frac{50}{1-.6} = 125$ $2(125) - 50 = 200$ C

4) $5x = 2$

$x = \frac{2}{5} \cdot 60 = 24$ min E

5) $100a - 50b - 10c$ B

6) $50x + 75(100 - x) = 100 \cdot 60$

$x = 6$ D

7) $mc = a$

$(m-4)(c+100) = a$

$(m+6)(c-100) = a$

$c = 500$ $m = 24$

12,000 B

8) $v\,2\frac{55}{60} = 40 \cdot 2\frac{5}{60}$

$v = 28\frac{4}{7}$ D

9) $x\frac{1}{y} = \frac{1}{3}$ $(x+3)\frac{1}{y} = \frac{1}{2}$

$3x = y$ $2x - 6 = y$

$2x - 6 = 3x$

$x = 6$ $y = 18$ E

10) $x^2 + y^2 = 89$

$10y + x = 10x + y + 27$

$9x - 9y = -27$

$x - y = -3$

$x = y - 3$

$y^2 + 6y + 9 + y^2 = 89$

$2y^2 + 6y - 80 = 0$

$y^2 + 3y - 40 = 0$

$(y-5)(y+5) = 0$

5 and 8 B

11) $12\left[(x - 15) - 15\right] = x$

$12 - 360 = x$

$11x = 360$

$x = \frac{360}{11}$ or $32\frac{8}{11}$

$3:32\frac{8}{11}$ D

12. $q = 2h$

$q = 4d$

$100d + 50h + 25q = 1500$

$4d + 2h + q = 60$

$3q = 60$

$q = 20$ $h = 10$ $d = 5$ D

13. $\frac{3}{7} + \frac{2}{7} \div \frac{3}{14} = \frac{1}{x}$

$6y + 4x + 3x = 14$

$13x = 14$

$x = \frac{14}{13}$ A

14. $1.5x = 4.5(6 - x)$

$x = 3(6 - x)$

$x = 18 - 3x$

$4x = 18$

$x = \frac{9}{2}$ $\frac{3}{2} \cdot \frac{9}{2} = \frac{27}{4}$ C

15. $4(x-2) = 3x$

$4x - 8 = 3x$

$x = 8$

$8 - 2 = 6$ A

16. $\frac{A+200}{T-50} = \frac{4}{1}$ $\frac{A+300}{T-65} = \frac{6}{13}$

$A + 200 = 4T - 200$ $13A + 2600 = 6(5 - 5200$

$A = 4T - 400$ $13(4T - 400) + 2600 = 6(5T - 5200$

$52T - 5200 + 2600 = 6(5T - 5200$

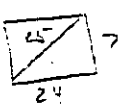
$-8T = -1200$

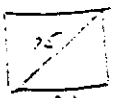
$T = 150$

$A = 200$ A

17. $5g + 4s = 3g + 12s$

$\frac{2g}{5s} = \frac{8s}{5s}$ $\frac{1}{4} = \frac{s}{g}$ D

18. 



168 B

19. $xy = 120$

$(x-5)(y+2) = 120$

6 and 20 B

-8 and -15

20. $x^{\frac{1}{2}} - 3x^{\frac{3}{4}} = 40$

$n^2 - 3n - 40 = 0$

$n = 8$ or -5 E

$x = 16$ $x = 5\sqrt[3]{5}$

21. $xy = 36$ $(x+4)(y-1) = 360$

$xy - x + 4y - 4 = 360$

$x - 4y = -4$

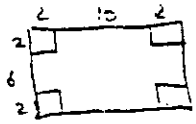
$\frac{360}{y} - 4y = -4$ $y^2 - y - 90 = 0$

$y = 10$ $+9$ C

22. $(x+3)y = 6$

$(x-3)(\frac{8}{3} - y) = 6$ D

$x = 6$ $y = \frac{2}{3}$

23. 

volume 120

$9\pi h = 120$

$h = \frac{120}{9\pi} = \frac{40}{3\pi}$ C

24. $\frac{1}{3}x - \frac{1}{4}x - \frac{1}{5}x = \frac{1}{2}x + 7$

$20x - 15x - 12x = 30x + 420$

$17x = 13x + 420$ $x = 60$ E

25. $\frac{2 \cdot 3 \cdot 18}{21} = \frac{36}{7}$ E

26. $\frac{1}{x} - \frac{1}{y} = \frac{1}{2}$

$\frac{1}{x} - \frac{3}{12} = \frac{5}{12}$

21 A

27. center $(\frac{5}{2}, \frac{3}{2})$

$x - y + 1 = 0$

$\left|\frac{Ax + By + C}{\sqrt{A^2 + B^2}}\right| = \sqrt{2}$ E

28. C

29 $\frac{(x-6)^2}{49} + \frac{(y+4)^2}{9} = 1$

B

30 A