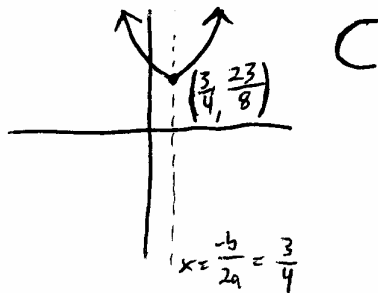


1.  $f(2,9) = 3 \cdot 2 \cdot 9 + \frac{18}{2} + 9^{3/2}$   
 $= 54 + 9 + 27$   
 $= 90$  E

2. C

3.



4.  $m = -\frac{A}{B} = -\frac{4}{2} = -2$  C

7.  $\frac{28+x}{112+x} \geq \frac{7}{20}$

5. A ( $k^2$  in denom.,  $h$  in num.)

$560 + 20x \geq 784 + 7x$

$13x \geq 224$

$x \geq 17.2$  C

6.  $\frac{\frac{a+b}{ab}}{\frac{a+b}{a-b}} = \frac{a+b}{ab} \cdot \frac{a-b}{a+b} = \frac{a-b}{ab}$  D

8.  $2x^2 - 5x + 3 = 0$

~~$(2x-3)(x-1) = 0$~~

$(2x-3)(x-1)$

$x = \frac{3}{2}, 1$  C

9.  $2 \cdot 25 + 2 \cdot 14 = 78$  cm A

10.  $\sqrt{(4-5)^2 + (-2-1)^2} = \sqrt{81+9}$

$= \sqrt{90} = 3\sqrt{10}$  C

11.  $V = \pi r^2 h$

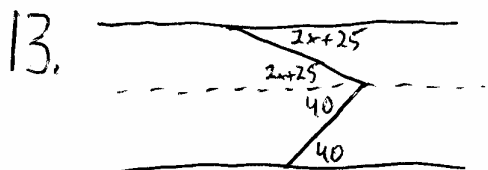
$2700 = \pi \cdot 225 \cdot h$

$h = \frac{2700}{225} = \frac{108}{9} = 12$  D

12.  $C = kV$

$10 = k \cdot 15 \cdot 10 \cdot 5 \Rightarrow k = \frac{1}{75}$

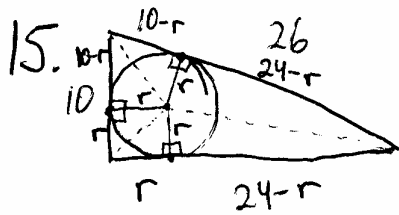
$C = \frac{1}{75} \cdot 15 \cdot 10 \cdot 4 \Rightarrow C = 8$  B



$2x+65 = x+70$

$x = 5$  B

14.  $3 \cdot 8 = 4 \cdot x \Rightarrow x = 6$  D



$$10 - r + (24 - r) = 26$$

$$8 = 2r$$

$$r = 4 \quad A$$

$$17. 8x - 6 - 3x - 3 = 8 + 4 - 16x$$

$$21x = 21$$

$$x = 1 \quad B$$

$$16. m = \frac{6 - 2}{2 - 4} = \frac{8}{-2} = -4$$

$$y = -4x + b$$

$$6 = -8 + b \Rightarrow b = 14$$

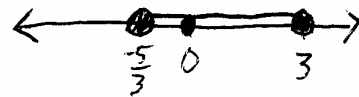
$$y = -4x + 14 \quad C$$

$$19. x - y + z = 2 \Rightarrow y = x + z - 2$$

$$2x - 3(x + z - 2) + z = 4$$

$$-x - 4z + 6 = 4$$

$$x = 2 - 4z \quad D$$



$$3(0^2) - 4(0) - 15 = -15 \leq 0$$

$$\frac{-5}{3} \leq x \leq 3$$

$$\cancel{x} \notin 1, 2, 3 \quad B$$

$$20. (1 - \frac{2}{3})(1 - \frac{1}{4})$$

$$\frac{1}{3} \cdot \frac{3}{4} = \frac{1}{4} \quad D$$

$$21. S = \frac{9}{1-r} = \frac{14}{\frac{2}{3}}$$

$$= \frac{42}{2} = 21 \quad C$$

$$22. 208 = 2^3 \cdot 5^2 = 2^4 \cdot 13^1$$

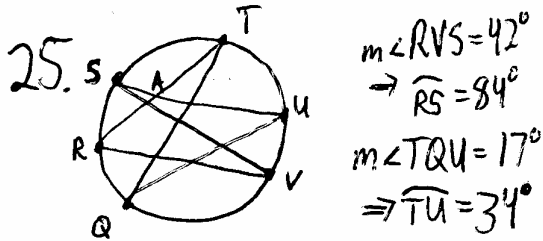
$$\text{number of factors} = (4+1)(1+1)$$

$$= 10 \quad A$$

$$23. 4 \cdot 49 + 1 \cdot 7 + 2 \cdot 1$$

$$196 + 7 + 2 = 205 \quad D$$

24. I.  $2 = 2 + 6 \cdot 0$  ✓  
 II.  $98 = 2 + 6 \cdot 16$  ✓  
 III.  $150 = 6 \cdot 25$  ✗ A



~~180 - SAT~~  
 $\angle TAU = \frac{34^\circ + 84^\circ}{2} = 59^\circ$   
 $\angle SAT = 180^\circ - \angle TAU = 121^\circ$  B

28.  $3^1 \Rightarrow 3, 3^2 \Rightarrow 9, 3^3 \Rightarrow 27, 3^4 \Rightarrow 81$   
 $\underbrace{\hspace{10em}}_{333} \quad \underbrace{\hspace{10em}}_{332}$  C

29.  $20 = 20, 2 \cdot 10, 4 \cdot 5, 2 \cdot 2 \cdot 5$   
 $2^1 \cdot 2^9, 2^1 \cdot 3^2, 2^4 \cdot 3^3, 2^4 \cdot 3 \cdot 5$   
 $\parallel \quad \parallel \quad \parallel \quad \parallel$   
 huge big 432 240 E

31.  $\frac{1}{10} \cdot \frac{1}{4} + \frac{9}{10} \cdot \frac{1}{20}$   
 $\frac{1}{40} + \frac{9}{200} = \frac{5}{200} + \frac{9}{200}$   
 $= \frac{14}{200} = \frac{7}{100}$  D

26.  $\Sigma(\text{not divisible}) = \Sigma(\text{all}) - \Sigma(\text{divisible})$   
 $= 1+2+3+\dots+98+99+100 = 50 \cdot 101$   
 $- (6+12+\dots+90+96) = \frac{17 \cdot 51}{2}$   
 ~~$= 5050 - 816 = 4234$~~   
 $= 5050 - 816 = 4234$  D

27. original number:  $TU = 10T + U$   
 reversed:  $UT = 10U + T$

$10U + T = 10T + U + 18$

$9U = 9T + 18$

$U = T + 2$

$9 = 7 + 2 \Rightarrow 79$  A

30.  $W^2 L^2 = \left(\frac{2}{3}\right)^2 \left(\frac{1}{3}\right)^2 = \frac{4}{81}$  any particular win-loss order

There are  $\binom{4}{2} = 6$  possible orders.

$\frac{4 \cdot 6}{81} = \frac{8}{27}$  B

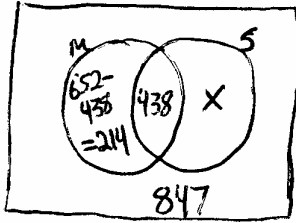
32. First card can be anything  $p=1$

2nd card can't be the same  $\frac{48}{51}$

3rd can't match either  $\frac{44}{50}$

$1 \cdot \frac{48}{51} \cdot \frac{44}{50} = \frac{352}{425}$  D

33.

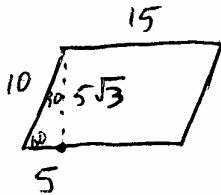


$$\begin{aligned} x &= 1500 - (847 + 652) \\ &= 1500 - (1499) \\ &= 1 \end{aligned} \quad E$$

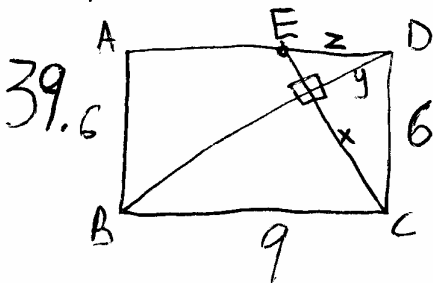
36.  $\frac{-22 - 47}{3} = -23 = d$

$$\begin{aligned} a &= 47 + d = 24 \\ b &= 47 + 2d = 1 \end{aligned} \quad D$$

38.



$$15 \cdot 5\sqrt{3} = 75\sqrt{3} \quad C$$



$$\frac{9}{x} = \frac{6}{y} \Rightarrow 3y = 2x$$

$$\frac{z}{y} = \frac{6}{x} \Rightarrow z = 6 \frac{y}{x} = 4 \quad B$$

34.  $3 \cdot 2^8 = 3 \cdot 2048$   
 $= 6144 \quad C$

35.  $3 + 6 + \dots + 108 + 111$   
 $= 114 \cdot \frac{37}{2} = 2109 \quad D$

37. 11th term is 10,  
 1st term is 30

$$\Rightarrow d = -2$$

$$49\text{th} = 1\text{st} + 48d$$

$$= 30 + 48(-2)$$

$$= -66 \quad C$$

40.  $45, 60, 75 = 15 \cdot 3, 15 \cdot 4, 15 \cdot 5$

right  $\Delta$

$$A = \frac{1}{2} \cdot 45 \cdot 60 = 30 \cdot 45$$

$$= 1350 \quad A$$