P. $-2\,{}^{2}/_{3}$

1. 4

2. 6720

3. $\frac{-14}{5}$ or 2.8

4. 30π

5. 23

6. 0

7. 104

8. 3

9. 92

10. $\frac{139}{81}$

11. 2

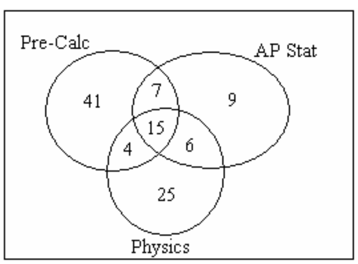
12. $\frac{1}{12}$

1. $(2x+3)(x-4)=0$, so x = -3/2 or x = 4.
   ANSWER: 4

2. $\frac{8!}{3!}=\frac{40320}{6}=6720$ **ANSWER: 6720**

3. $2^{2(2x-1)}=2^{3(3x+4)}$ so $2(2x-1)=3(3x+4)$
   4x – 2 = 9x + 12 so -14 = 5x
   $x=\frac{-14}{5}$ **or –2.8** **ANSWER:** $\frac{-14}{5}$ **or 2.8**

4. $36(x-1)^2+25(y-5)^2=900$
   $$\frac{(x-1)^2}{25}+\frac{(y-5)^2}{36}=1$$
   Area of ellipse = πab = $\pi(\sqrt{36})(\sqrt{25})$ = 30π
   ANSWER: 30π

5.


   130 – 41 – 7 – 9 – 15 – 4 – 6 – 25 = 23
   ANSWER: 23

6. The determinant of a matrix and the determinant of the transpose of the matrix are equal
   ANSWER: 0

7. $1008=2^4\cdot 3^2\cdot 7$
   odd factors are 1, 3, 7, (3)(3) = 9,
   (3)(7) = 21, and (3)(3)(7) = 63
   1 + 3 + 7 + 9 + 21 + 63 = 104 **ANSWER: 104**

8. $|3x-5|\le 11$ $\quad$ $|2x+1|>5$
   $-11\le 3x-5\le 11$ $\quad$ 2x + 1 > 5 or 2x + 1 < -5
   $-6\le 3x\le 16$ $\quad$ 2x > 4 or 2x < -6
   $-2\le x\le \frac{16}{3}$ $\quad$ x > 2 or x < -3
   The only integers the two solution sets share are 3, 4, and 5 **ANSWER: 3**

9. $\frac{2}{(1+\sqrt{3})+\sqrt{5}}\left(\frac{(1+\sqrt{3})-\sqrt{5}}{(1+\sqrt{3})-\sqrt{5}}\right)=$
   $\frac{2+2\sqrt{3}-2\sqrt{5}}{(1+2\sqrt{3}+3)-5}=\frac{2+2\sqrt{3}-2\sqrt{5}}{-1+2\sqrt{3}}$
   $\frac{2+2\sqrt{3}-2\sqrt{5}}{-1+2\sqrt{3}}\left(\frac{-1-2\sqrt{3}}{-1-2\sqrt{3}}\right)=$
   $\frac{-2-2\sqrt{3}+2\sqrt{5}-4\sqrt{3}-12+4\sqrt{15}}{1-12}=$
   $\frac{-14-6\sqrt{3}+2\sqrt{5}+4\sqrt{15}}{-11}$
   $=\frac{14+6\sqrt{3}-2\sqrt{5}-4\sqrt{15}}{11}$ A = 14, B = 6, C = -2, D = -4; AB + CD = 84 + 8 = 92
   ANSWER: 92

10. First 4 terms:
   $(1)^{\frac{1}{3}}+\frac{1}{3}(1)^{\frac{-2}{3}}(2)^1-\frac{1}{9}(1)^{\frac{-5}{3}}(2)^2+\frac{5}{81}(1)^{\frac{-8}{3}}(2)^3=$
   $1+\frac{2}{3}-\frac{4}{9}+\frac{40}{81}=\frac{139}{81}$ **ANSWER:** $\frac{139}{81}$

11. Use quadratic formula:
   $$x^2=\frac{5\pm\sqrt{25-4(3)(C)}}{2(3)}$$
   For real roots, discriminant $25 - 4(3)(C)\ge 0$
   $C\le\frac{25}{12}$; largest integer which satisfies equation is 2 **ANSWER: 2**

12. Only 4 restaurants remain for Tuesday, 3 remain for Wednesday; P = $\left(\frac{1}{4}\right)\left(\frac{1}{3}\right)=\frac{1}{12}$
   ANSWER: $\frac{1}{12}$