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|----------------------------------|-----------------------|
| 1. 240 | 25. 7 |
| 2. $\frac{\pi}{4}$ | 26. 4:1 |
| 3. $\frac{\pi}{2}$ | 27. 1 |
| 4. 85 | 28. (-7,40) |
| 5. 81 | 29. 60 |
| 6. $\frac{7}{6}a - \frac{5}{2}b$ | 30. $x^2 + 36x + 320$ |
| 7. $\frac{16}{25}$ | 31. -1 |
| 8. $\frac{3\pi}{2}$ | 32. 3.2 |
| 9. 55 | 33. 16 |
| 10. 3,628,800 | 34. 60% |
| 11. 28 | 35. 15 |
| 12. $\frac{1}{3}$ | 36. 28% |
| 13. 49 | 37. 4:16 |
| 14. $14\sqrt{2}$ | 38. 403.2 |
| 15. -2 | 39. 7 |
| 16. 59 | 40. 9 |
| 17. distributive | |
| 18. $\frac{64}{125}$ | |
| 19. $-\frac{2}{7}$ | |
| 20. 18 | |
| 21. 10 | |
| 22. 21 | |
| 23. 3 | |
| 24. 24 | |

Solutions:

$$1. \frac{5!4!}{3!2!} = \frac{5 \cdot 4 \cdot 3! \cdot 4 \cdot 3 \cdot 2!}{3!2!}$$

$$= 5 \cdot 4 \cdot 4 \cdot 3 = 240$$

2. The circle has a radius of r so the square has a side of $2r$. Ratio of

$$\text{areas is } \frac{\pi r^2}{4r^2} = \frac{\pi}{4}.$$

3. The circle has a radius of r so the square has a diagonal of $2r$ and a side of $r\sqrt{2}$. Ratio of areas is

$$\frac{\pi r^2}{2r^2} = \frac{\pi}{2}.$$

4. $235\text{mph} - 150\text{pmh} = 85\text{mph}$

5. $3^4 = 9 \cdot 9 = 81$

$$6. \frac{4}{3}a - \frac{1}{6}a - \frac{8}{5}b - \frac{9}{10}b$$

$$= \frac{8}{6}a - \frac{1}{6}a - \frac{16}{10}b - \frac{9}{10}b$$

$$= \frac{7}{6}a - \frac{25}{10}b = \frac{7}{6}a - \frac{5}{2}b$$

7. There are 36 border stamps. So probability would be

$$\frac{100 - 36}{100} = \frac{64}{100} = \frac{16}{25}$$

8. $270 \cdot \frac{\pi}{180} = \frac{3\pi}{2}$

9. $1+2+3+4+5+6+7+8+9+10=55$

10. $1*2*3*4*5*6*7*8*9*10$
 $= 3,628,800$

11. She basically climbs 500ft/day.

After night 27 she's at 13,500ft. So on day 28, starting at 13,500ft and able to climb up to 1,000ft over the day she will reach summit before night on the 28th day.

12. $\overline{.333} = \frac{333}{999} = \frac{1}{3}$

13. GCF = 7 and LCM = 42
 $7+42 = 49$

14. $A=196$ so $S=14$

$$\text{Then } D = S\sqrt{2} = 14\sqrt{2}$$

15. $(i+1)(i-1) = i^2 - 1$
 $= -1 - 1 = -2$

16. The prime numbers are 2, 3, 5, 7,
11, 13, 17, 19, 23, 29, 31, 37, 41,
43, 47, 53, **59**, 61, 67...so **59** is the
largest prime number less than 60.

17. The Distributive Property: The
distributive property lets you
multiply a sum by multiplying each
addend separately and then
adding the products.

$$18. \left(\frac{25}{16}\right)^{\frac{3}{2}} = \left(\frac{5^2}{4^2}\right)^{\frac{3}{2}}$$

$$= \left(\frac{5}{4}\right)^{-3} = \frac{64}{125}$$

$$2x + 7y = 4$$

$$19. 7y = -2x + 4$$

$$y = -\frac{2}{7}x + \frac{4}{7}$$

$$20. \begin{aligned} 17 + y - 12 &= 23 \\ y &= 18 \end{aligned}$$

$$x + y = 7$$

$$x - y = 3$$

$$2x = 10$$

$$21. \begin{aligned} x &= 5 \\ y &= 2 \\ xy &= 5 \cdot 2 = 10 \end{aligned}$$

$$22. 5 \cdot 7 \cdot 9 = 315$$

$$5 + 7 + 9 = 21$$

23. Start: 2 ft, 1 week: 3ft, 2 week:
4.5ft, 3 week: 6.75ft

$$24. 4 \cdot 3 \cdot 2 = 24$$

25. Dubai is 10 hours ahead of St.
Louis and 3 hours ahead of Paris
so Paris is 7 hours ahead of St.
Louis.

$$26. \frac{16 \cdot 20}{8 \cdot 10} = 4:1$$

$$27. \left(\left(\left(x^2\right)^0\right)\right)^6$$

$$= \left(\left(1\right)^1\right)^6 = (1)^6 = 1$$

$$28. \left(\frac{-57 + 43}{2}, \frac{64 + 16}{2}\right) = \left(\frac{-14}{2}, \frac{80}{2}\right)$$

$$= (-7, 40)$$

$$29. A = \frac{8 \cdot 15}{2} = 4 \cdot 15 = 60$$

$$30. \begin{aligned} (x + 20)(x + 16) &= \\ x^2 + 36x + 320 & \end{aligned}$$

$$31. (i^{20})(-i^{16}) = (1)(-1) = -1$$

$$32. \frac{16}{100} = \frac{x}{20}$$

$$\frac{16 \cdot 20}{100} = \frac{320}{100} = 3.2$$

$$33. \sqrt{(8)(32)} = \sqrt{(2 \cdot 4)(2 \cdot 16)}$$

$$= (2 \cdot 4) \sqrt{(2)(2)} = 2 \cdot 4 \cdot 2 = 16$$

$$\frac{24}{40} = \frac{x}{100}$$

$$34. \frac{6}{10} = \frac{x}{100}$$

$$x = 60\%$$

$$5n + 10d = 275$$

$$n = 25$$

$$35. 5(25) + 10d = 275$$

$$125 + 10d = 275$$

$$10d = 150$$

$$d = 15$$

$$\left((x - .1x) - .2(x - .1x) \right)$$

$$= \left((.9x) - .2(.9x) \right)$$

$$36. = \left((.9x) - (.18x) \right) \quad \text{so } 28\%$$

$$= .72x$$

$$x - .72x = .28x$$

$$37. \frac{553}{60} = 9r13 \text{ so } 553 \text{ minutes from}$$

now is 9 hours and 13 minutes

later than 7:03 which would be

4:16.

$$2x + 3x + 4x + 5x + 6x = 20x$$

$$38. 20(20.16) = 403.2$$

$$1! + 3! + 5! =$$

$$39. (1) + (3 \cdot 2) + (5 \cdot 4 \cdot 3 \cdot 2)$$

$$= 1 + 6 + 120 = 127$$

40. $9^3 = 729$ and $10^3 = 1000$ so 9 is the largest integer with a cube less than 1000.