

Math 152 Sec S0601/S0602
Practice Problems for Test 3

The following problems are good practice for the upcoming test. Some are challenging, but completely within the scope of the material we have covered. Round any final calculator answers to 1 decimal.

1. Compute exactly

(i) $\sin^{-1}(\sin(5\pi/6))$

(ii) $\sin(\sin^{-1}(5/6))$

(iii) $\tan(\sin^{-1}(-2/3))$

(iv) $\sin^{-1}(\cos(\sin^{-1}(1/2)))$

2. Simplify $\sin(\tan^{-1}(a/b))$, giving your answer in terms of a and b .

3. Recall that $\cos(2A) = \cos^2(A) - \sin^2(A)$ for any angle A . Using this, simplify $\cos(2\sin^{-1}(x))$ where $-1 \leq x \leq 1$.

4. Expand $(2t + 3/t)^5$ using the binomial theorem.

5. Simplify $\binom{5}{2} - \binom{4}{2} - \binom{4}{1}$.

6. Find the term of $\left(\frac{3x^2}{2} - \frac{1}{3x}\right)^{12}$ that does not contain x .

7. An arithmetic sequence has $a_{17} = -40$ and $a_{28} = -73$. Find a_1 .

8. An arithmetic sequence has $a_{11} - a_8 = 12$ while $a_{15} = 20$. Find a_{16} .

9. Find the tenth term of the geometric sequence $7/2, -7/4, 7/8, \dots$

10. A geometric sequence has $a_4 = 5\pi$ and $a_6 = \pi/5$. Find a_1 .

Math 152 Sec S0601/S0602
Practice Problems for Test 3

11. Find the sum of the arithmetic series $-1 + 4 + 9 + \cdots + 54$.

ans: 18

12. Find the sum of the first six terms of the geometric series $-1 + 1/4 - 1/16 + \cdots$.

ans: $-1701/618$

13. At the beginning of each year you deposit $\$P$ into an investment which pays 8% compounded annually. The investment is worth $\$40,000$ at the end of ten years. How much were the annual payments P ?

ans: $\$2556.65$